

## SpeedLine ABC

Production turning machine



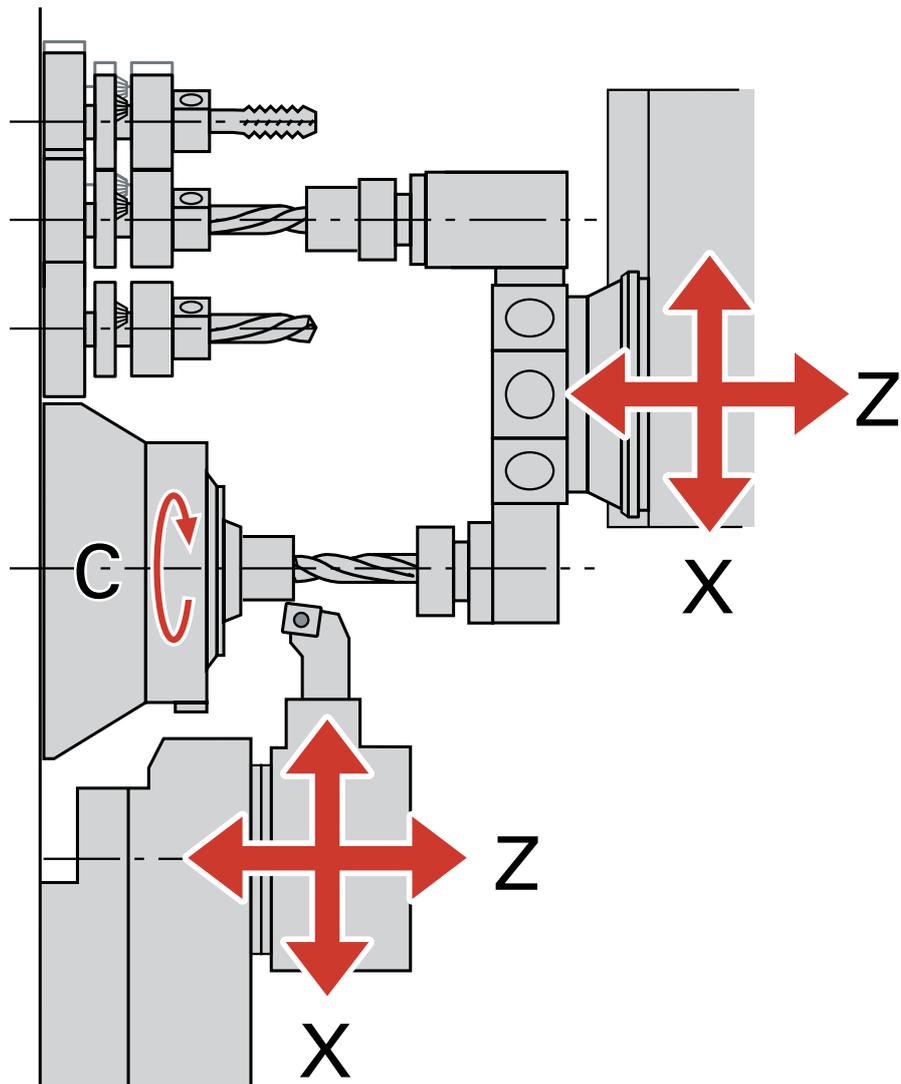
# More dynamics, less setup – unsurpassed power density

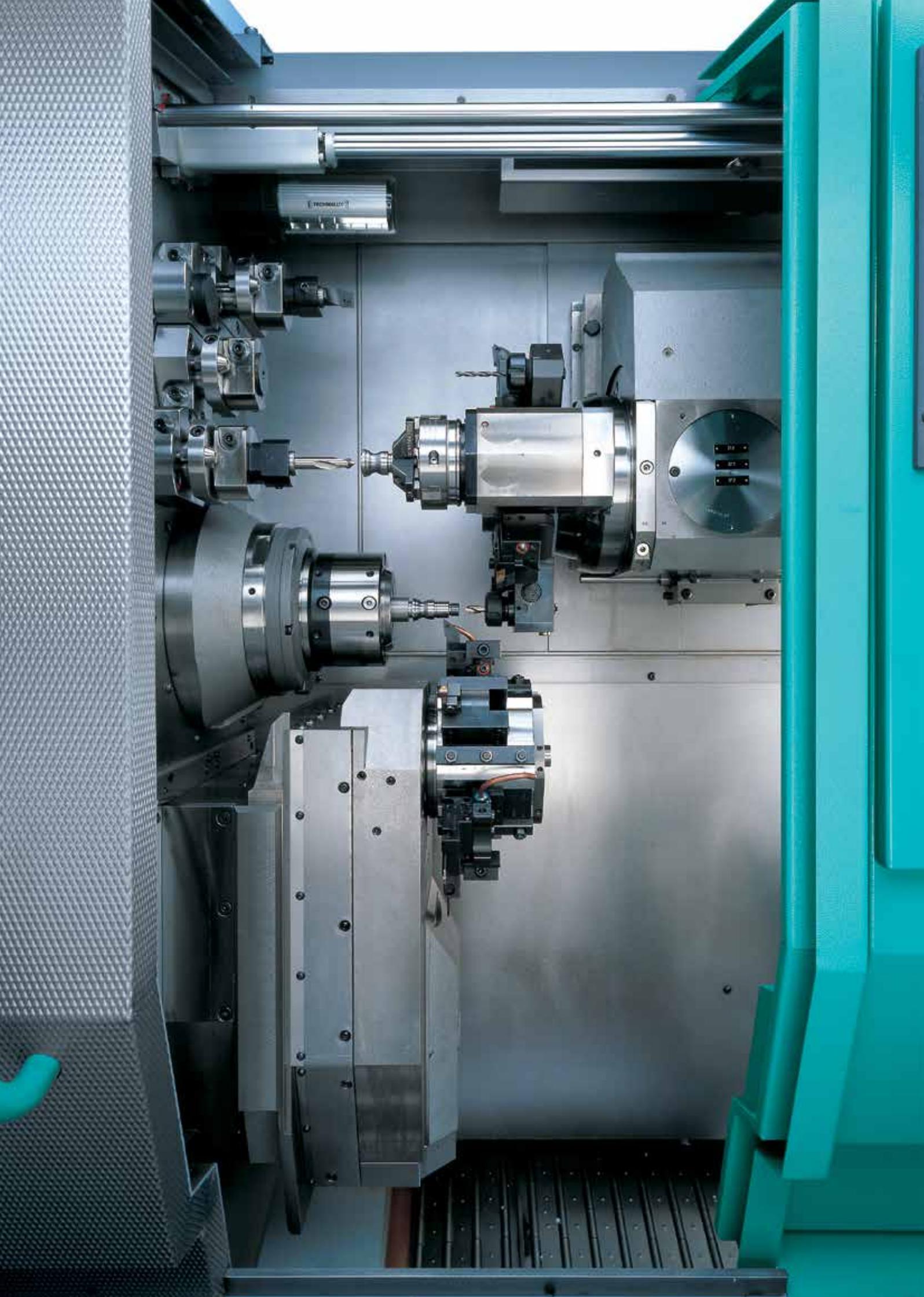
For machining simple to highly complex parts in small to large lot sizes, the INDEX ABC with a Siemens S840D sl or Fanuc 31i-B control always provides for economic and productive solutions.

The production turning machine INDEX ABC produces for you simple automatic turned parts just as well as complex CNC turned parts. You work with high flexibility, deliver best quality and produce economically. The possibilities are almost unlimited. The technical equipment is designed to meet your needs: There are up to 19 tools available with which you can completely produce your workpieces on one machine.

**Your benefits:**

- compact design and high performance with unrivalled low space requirements
- spindle clearance: up to 65 mm
- reduced cycle time through a highly dynamic work spindle and simultaneous machining with up to 3 tools
- live tools can be used on all tool holders
- up to 5 reverse side machining stations
- easy to set up thanks to very good accessibility with INDEX W-serration
- polygon turning possible also in steel



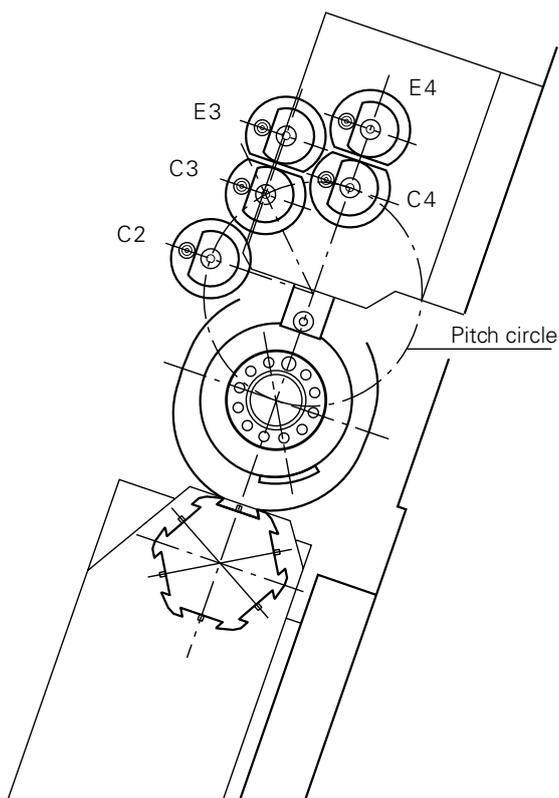


## Automatic turning to perfection



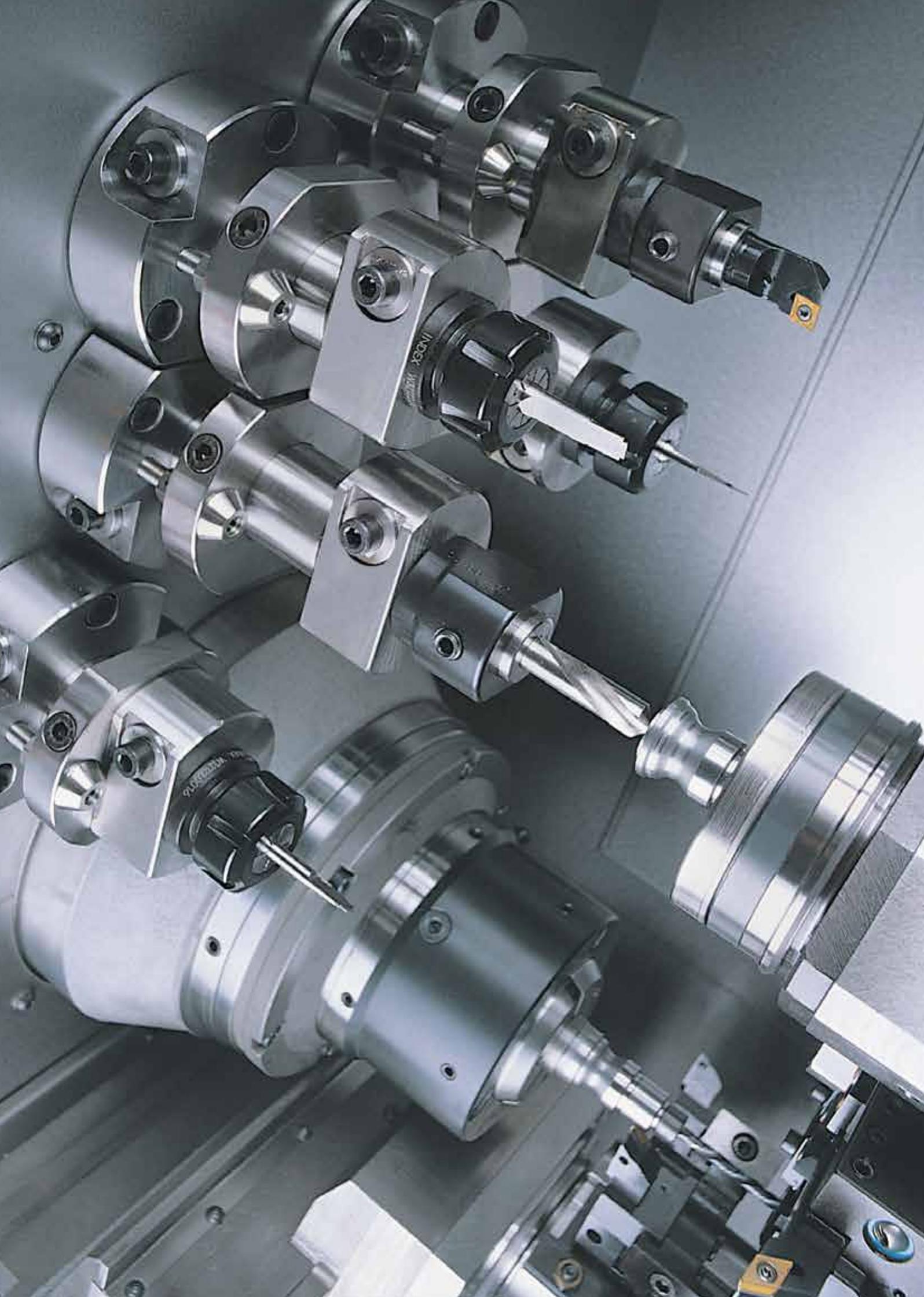
The INDEX ABC has 2 tool turrets with 14 tool mountings. An upper turret with 7 tool stations plus a fixed station for mounting a synchronous spindle (for chuck or collet clamping) and a lower turret with additional 6 tool mountings. Plus five back-boring stations (of which 2 are live) for cutoff-end machining.

Optional polygon turning unit up to size 24 also in steel.

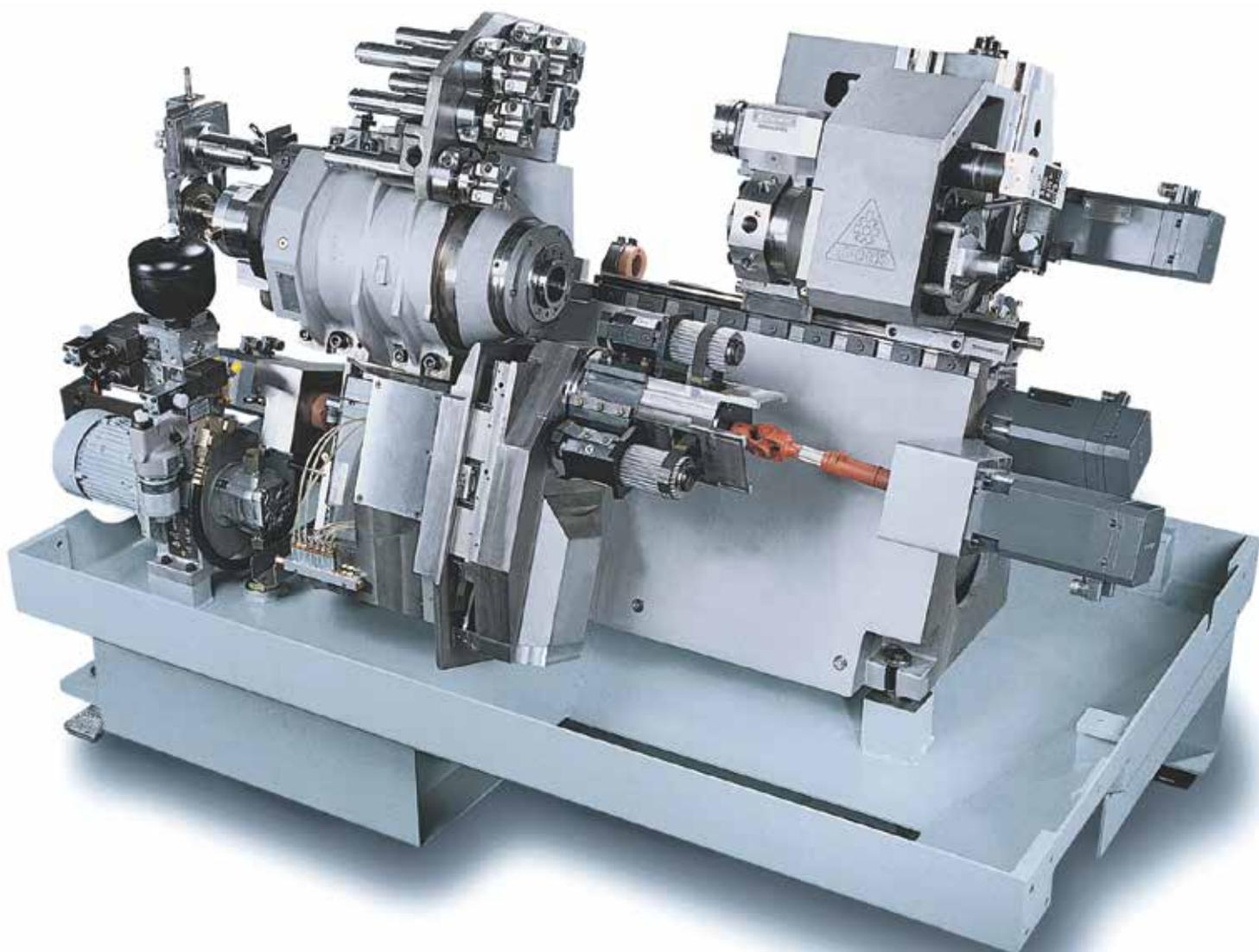


### Complete machining

With 5 back-boring stations (of which 2 are live), workpieces can be machined also on the cutoff end.



## Technology with impressive results

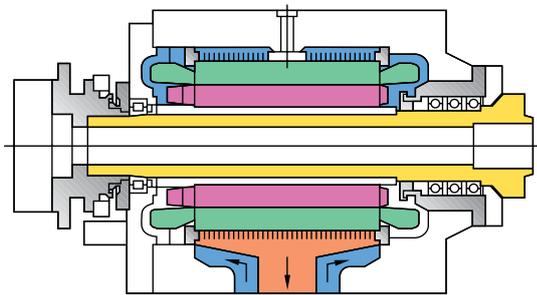


# The power density

## Motorized spindle

High-torque hollow-shaft synchronous motor with patented headstock air cooling. It delivers 20 kW of power at 100%. A low air over-pressure in the headstock prevents ingress of emulsion;

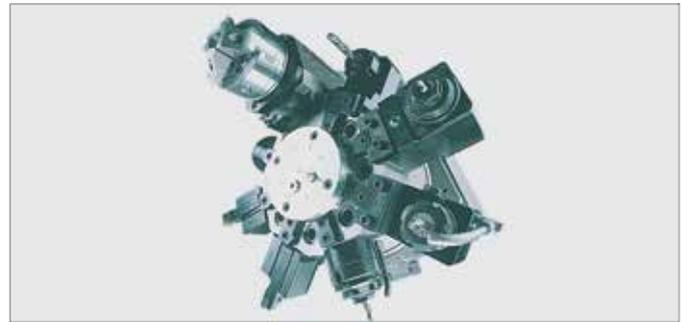
rotor, end windings and stator are cooled directly. Short acceleration times, no mechanical transmission elements, low rotating masses, maximum smoothness, high torsional stiffness.



## Synchronous spindle

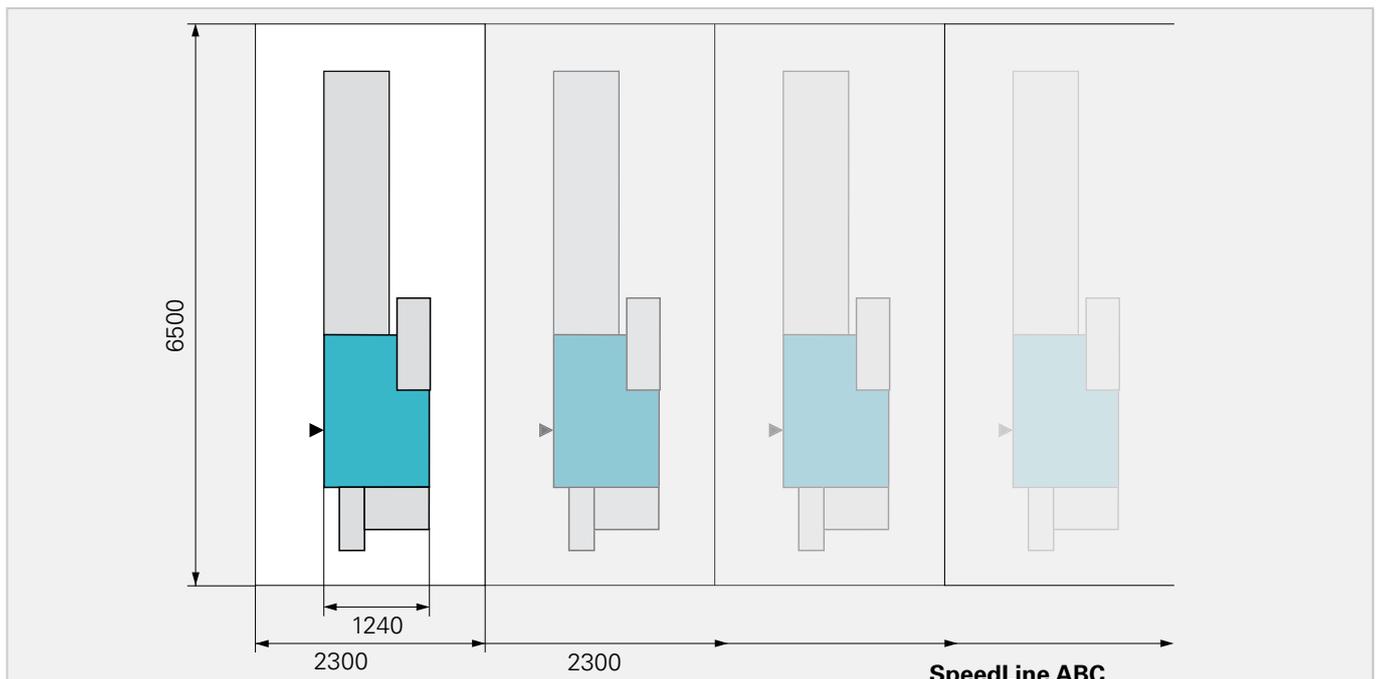
With collet clamping up to 42 mm or with 90 mm chuck diameter also for internal clamping. Max. speed 4,500 rpm The synchronous spindle is equipped with an alignment and indexing unit as standard.

It is driven separately from the central drive on a dedicated turret station by a spur gear.



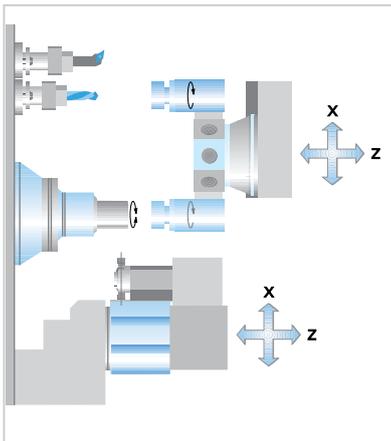
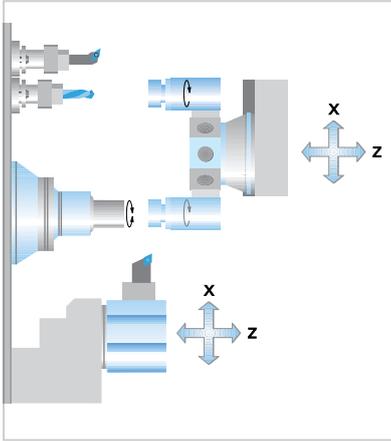
<b>Productivity:</b> CuZn39Pb3 F37 ø 49 x 33 mm	<b>Siemens 840C</b>  <b>102 s</b>	<b>Siemens 840D</b>  <b>93 s</b>	<b>Siemens 840D sl</b>  <b>87 s</b>
	Part production times are valid for only this specified part.		

## More machines in a production line



## Precision in automatic turning

A large variety of machining options for a wide range of parts



### An investment that pays for itself

No matter what you produce – the ABC is the solution for all your manufacturing tasks. Regardless of whether you produce classic or demanding automatic turned parts. Whether you perform complex CNC turning or simple reworking.

Your benefits when using an ABC: You turn complex workpieces in one cycle. You save throughput and setup times. The ABC allows you to produce even small batch sizes economically. You increase your production reliability.

## Automation and additional equipment



### The ABC comes with an interface for bar loading magazines as standard.

- By attaching a loading magazine INDEX LMI, you gain up to 4 s for bar feeding in connection with the bar feeder

- Attaching the loading magazine INDEX MBL provides for maximum smoothness and accuracy due to the unique guiding principle
- The interface also allows attaching common third-party makes



### Reduce your unit costs

You need another machining station for the production of threads and polygons? The ABC can be equipped with an auxiliary drive. This allows you to realize threads and polygons in brass, aluminum, steel and free machining

steels using common methods in a minimum of time.



### Automated workpiece handling

The removal unit moves the finished turned parts to a conveyor belt, while the next part is being machined. The bar remnant is carried away separately.

# The control INDEX C200-4D sl: New – Fast – Optimal

## New

The control concept of the INDEX ABC-sl consistently relies on the new SIEMENS S840D sl (solution line) control and the new generation SIEMENS SINAMICS drive. This ensures a future-proof investment: the user gets the latest generation of control technology that supports any type of application. Also the use of Virtual Line for programming support (VPro) or simulation (VM) is now easily possible directly on the control screen! This reduce time and cost!

## Fast

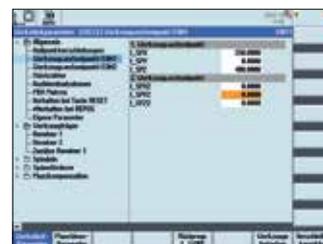
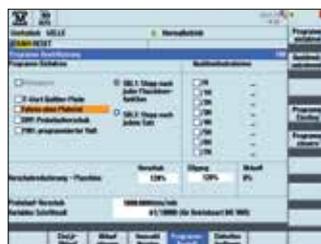
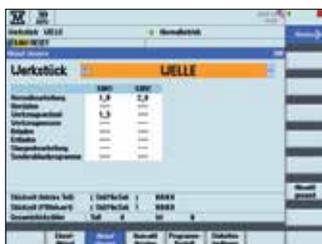
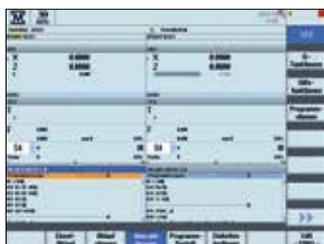
The consistent use of the performance-enhanced S840D solution line control provides uncompromising short execution times for all types of machining operations. At the same time, NC servo drives in both turrets allow shortest retooling and chip-to-chip times. Also the new main spindle drive featuring state-of-the-art synchronous motor technology is not only more energy-efficient, but contributes with markedly reduced acceleration and deceleration times to the significantly increased productivity of the ABC-sl.

## Optimal

The new INDEX C200-sl control, enhanced by INDEX with intelligent machine functions, optimally supports simultaneous machining operations with multiple tool carriers. For example, the new control facilitates also directly the loading of new workpieces – if required also separate by subsystems. In combination with INDEX machine cycles, this creates optimized machining processes in minimal time – a truly added value of the machine. This is all inclusive machining efficiency!

## Complete

All INDEX ABC-sl machines come with extensive control equipment: TRANSMIT (front side) and TRACYL (peripheral surfaces) machining operations are included. Milling and drilling operations – also off-center – are easily programmed and executed in the X/Y or Y/Z plane. INDEX ABC-sl with the new C200-sl control – automatic bar lathe and turning center in one – complete from the factory!



## Advanced

- The latest editor for easy and fast programming
- Convenient display functions such as multi-editor, animated cycles, etc.
- Programming of mathematical functions, variables and workpiece counts
- The same functionality for turning, milling, drilling
- Easy network integration through control-integrated network technology
- Intelligent online help, detailed descriptions of error causes and remedies
- More than 20 foreign languages

## Efficient

- Positions and movements of all axes and spindles in the home screen (INDEX)
- Largely unchanged machine operation and key arrangement (INDEX)
- Practical machine cycles for safe and collision-free machine operation
- Supported re-entry after program termination
- Internal calculation accuracy better than nano-interpolation (80 bit floating point arithmetic)
- All displays and operating inputs in clear text

## Productive

- The latest generation of control for maximum quality and productivity
- Comprehensive technology cycles for error-free and optimal machining quality
- Fast and safe job change with automatic saving of setup data and automatic re-initialization at (re-)selection of the job
- INDEX Virtual Machine & VPro programming studio for programming, setup, optimizing on a PC (option) or on the machine control panel (option)

## Safe

- Safe machine start by start requirements and guided return to the machine home position
- Direct access to tool offsets, program parameters, etc. via individual keys
- Supported machine operation through backlighting of active control buttons
- Safety Integrated Inside: Continuous safety monitoring and testing integrated in the control
- INDEX tool breakage monitoring available (option)

EX ABC

The screen displays a coordinate system with the following values:

Axis	Value
X	200.0000
Y	200.0000
Z	100.0000

Below the coordinate system, there are several rows of data, likely representing tool parameters or program settings:

Parameter	Value
SPINDLE	2000 RPM
FEED	1000 mm/min
TOOL	T0101
COORDINATE SYSTEM	G54

The keypad on the right side of the screen includes a standard alphanumeric keyboard, function keys for 'F', 'S', 'T', 'M', 'R', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z', and a numeric keypad. There are also several icons for system functions like 'Home', 'Reset', and 'Emergency Stop'.

The physical control panel features a central keypad with directional and function keys. To the left of the keypad is a large black rotary knob with a scale from 0 to 100%. To the right is another large black rotary knob with a scale from 0 to 100%. A prominent red emergency stop button is located on the right side of the panel. Above the knobs are several indicator lights and smaller control buttons. Below the main panel, there are two additional rotary knobs, one labeled 'SPINDLE' and the other 'FEED'.

# The control FANUC 31i: Powerful and proven

## FANUC Control 31i- Model B – the future-proof standard control.

### All advantages at a glance:

- Control of the latest FANUC series (30-Series, Model B)
- FANUC control panel with CNC keyboard and 10.4" TFT color display
- Original FANUC machine control panel with axis and spindle override
- Electronic handwheel integrated in machine control panel (standard)

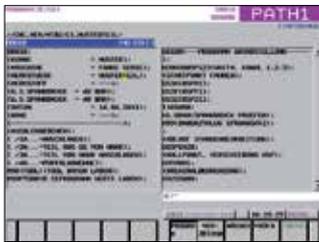
- Memory for 1000 part programs or more
- File system with 3 levels (folders) for structured program storage
- USB interface and CARD reader at the control panel
- Advanced operator safety by FANUC Dual Check Safety

## INDEX enhancements and additions

- Individual keys on the control panel with direct access to the following functions:
  - Turret indexing / Single station (CCW/CW)
  - Setup / Production (key switch removable in "Production" position)
  - Cycle Start / Cycle Stop
  - Consent function
  - Open workpiece clamping
- INDEX-specific enhancements of the user

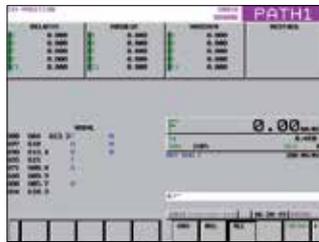
interface for easier machine operation, program and parameter input, machine monitoring

- Sensorless tool monitoring based on motor current
- Freely programmable interface for adjusting external (automation) devices to the machine (e.g., handling system)



### Programming

- Text editor with Insert, Overwrite, Find, Replace, Copy, and Delete functions
- Annotating NC programs
- NC program numbers or NC program names
- Up to 3 M functions possible per NC block
- Dwell time in seconds
- Conditional or unconditional program branching
- Arithmetic and trigonometric computing operations
- Parameter calculation and reading/loading of system data



### Technology

- Standard cycles for turning and milling
- Cutting longitudinal, transverse and tapered threads with constant or variable pitch
- Threading without compensating chuck (up to  $n_{max} = 2000$  rpm)
- TRANSMIT and cylinder surface interpolation
- Oriented spindle stop
- Minimum input/output unit 0.0001 mm or 0.00001"
- Handwheel-controlled travel movements



### Program input/output

- Program input via control keyboard
- USB port
- Memory card
- ETHERNET-interface
- Input switchable between metric/inch for
  - Program entry
  - Programmed travel movements
  - Tool offsets
  - Screen display
- Two-channel program display and two-channel editor (depending on machine equipment level)



### Production

- Absolute measuring systems in all axes, i.e. no referencing required
- Electronic tool offset in X, Z
- Total number-of-parts counter
  - Counter for setting the order batch size
- Tool breakage monitoring (option)

GE Fanuc Series 31i-MODEL B

00010 H00000 **PATH1** 00020 H00000

ACTIVE POSITION		COORD H00000		PATH1		ABSOLUTE	
RELATIVE	179.881	ABSOLUTE	179.881	RELATIVE	305.241	ABSOLUTE	305.241
	297.529		297.529		129.529		129.529
	0.000		0.000		0.000		0.000
	0.000		0.000		100.054		100.054
	337.469		337.469				

DISTANCE TO GO

MACHINE		DISTANCE TO GO		MACHINE		DISTANCE TO GO	
RELATIVE	179.881			RELATIVE	305.241		
	297.529				129.529		
	0.000				0.000		
	0.000				100.054		
	337.469						

0.0004/MIN  
00100 LI 0  
600 MM/MIN  
13381

12:50:03

ABSOLUTE RELATIVE ALL CLEAR



Control panel featuring a keyboard and various control elements:

- Emergency Stop:** A large red button with a yellow ring.
- Mode Selector:** A rotary switch with 'I' and 'O' positions.
- Speed Dials:** Two rotary dials for speed control, labeled 'MM/MIN' and 'MM'.
- Keyboard:** A standard QWERTY keyboard with additional function keys.
- Control Buttons:** A grid of buttons for numerical input (1-9, 0, +/-) and other functions.

## Technical data

		SIEMENS	FANUC
<b>Main spindle</b>		<b>D65</b>	<b>D60</b>
Bar capacity	mm	65	60
Bar feed max.	mm	80	80
Speed	rpm	6000	6000
Acceleration time (0 - 5000 rpm)	sec.	approx. 1.2	approx. 1.2
Power at 100% / 40%	kW	20 / 27	20 / 29
Torque at 100% / 40%	Nm	105 / 145	105 / 145
Option: C-axis / aligning and indexing unit (pitch angle 2.5°)			

<b>Turret 1</b>		<b>X-axis</b>	<b>Z-axis</b>	<b>X-axis</b>	<b>Z-axis</b>
Number of stations		8 (7 + synchronous spindle)		8 (7 + synchronous spindle)	
Tooling system DIN 69880	mm	25		25	
Slide travels	mm	90	280	90	280
Feed forces	N	5500	5500	5500	5500
Rapid traverse rate	m/min	27	36	27	36
Acceleration	m/s <sup>2</sup>	6	6	6	6
Resolution	mm	0.0005	0.001	0.0005	0.001
Option: Tool drive unit for all stations					
Speed	rpm	6000		6000	
Power at 25%	kW	4,2		3,3	
Torque at 25%	Nm	10		7,5	

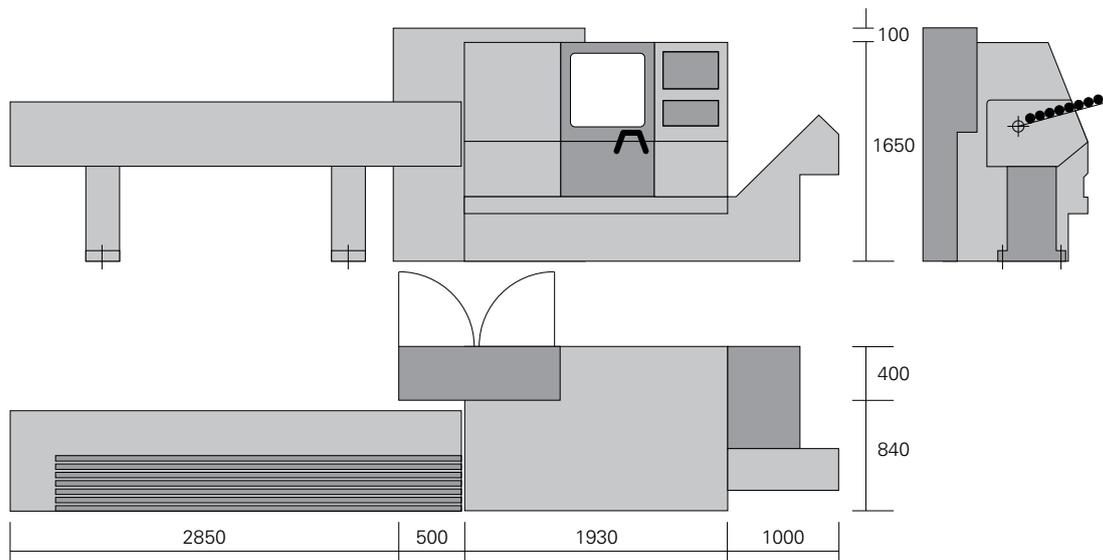
<b>Synchronous spindle</b>			
Speed	rpm	4500	4500
Power at 25%	kW	4.2	4.2
Torque at 25%	Nm	10	10
Alignment and indexing unit (pitch angle 7.5°) / hydraulic ejecting and flushing unit (ejector stroke 42 mm)			

<b>Back-boring stations</b>			
Number		5	5
Live tools max.		2	2
Speed	rpm	6000	6000
Power at 25%	kW	4.5	4.5
Torque at 25%	Nm	8	8

<b>Turret 2</b>		<b>X-axis</b>	<b>Z-axis</b>	<b>X-axis</b>	<b>Z-axis</b>
Number of tools		6		6	
Tooling system dovetail mounting with parallel shank					
Slide travels	mm	81	80	81	80
Feed forces	N	8300	5500	8300	5500
Rapid traverse rate	m/min	27	36	27	36
Acceleration	m/s <sup>2</sup>	6	6	6	6
Resolution	mm	0.0005	0.001	0.0005	0.001
Tool drive unit for all stations					
Speed	rpm	6000		4500	
Power at 25%	kW	4.2		4.2	
Torque at 25%	Nm	10		7.5	
Option: Thread cutting unit, polygon turning unit (simultaneously mountable to a max. of 2 stations)					
Speed	rpm	6000		6000	
Power at 25%	kW	5.2		6.9	

<b>Weights and connecting values with max. configuration</b>			
Mass	approx. kg	2500	
Electrical connection		12-34 kW, 15-43 kV, 25-80 A, 400 V, 50 / 60 Hz	

<b>Control</b>	INDEX C200-4D ((based on Siemens S840D sl)	FANUC 31i-B
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# INDEX

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