

## PICOMAX® 95: Step towards a new dimension



# PICOMAX® 95

# FEHLMANN

## FEHLMANN: The trademark.

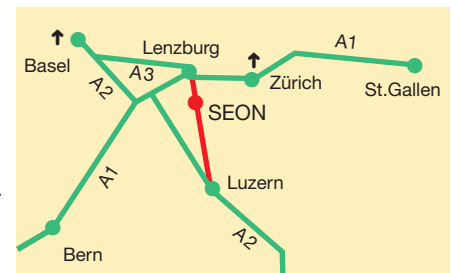


### Precision «Made in Switzerland» since 1930.

*At FEHLMANN, the customer will receive everything from a single source! The high quality standard covers the entire production process and is reflected in all our products. Development, production and assembly are carried out exclusively in the main plant at Seon, Switzerland by more than 180 staff members. Trained and specialised FEHLMANN staff as well as local representations constitute our customer service.*

*Experts mention as outstanding features: maximum precision, ergonomics, reliability and handiness. By quality, however, FEHLMANN also understands the development of machines coming up to the actual requirements in the workshop.*

**We have the experience in practical operation.**



**Longer travels,  
more tools, more ‚speed‘ and  
a more rigid spindle.**



# General survey of the PICOMAX® 95.

*The high-speed spindle integrated into the vertical column is equipped with hybrid bearings and offers a speed range of 50-20,000 rpm and disposes of Z/S interpolation for tapping without compensation chuck.*

*All axes drives are driven via ball screw and digital AC drivers with AC motor.*

*The axes are equipped with high-precision glass scales with compressed-inlet for direct path measurement.*

*The quiet, low-vibration machine operation permits top precision and excellent surface finish.*

## **Most versatile applications.**

- *In mould manufacturing for milling of hardened tooling steel*
- *For the production of general machine components of maximum precision*
- *Medical technology for milling of titanium and stainless steels*
- *Automated for manless production*
- *In 5-face machining (in combination with the FEHLMANN dividing attachments)*
- *In tool, jigs & fixtures manufacturing*
- *For manufacturing of complex aluminium parts*

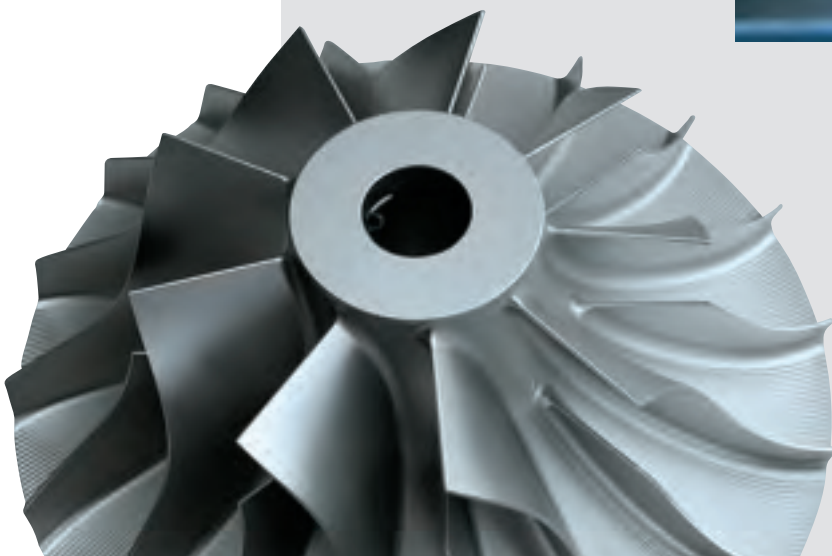
## *Further features and characteristics:*

- *Ergonomic design ensures operator accessibility to machine and accesso equipment.*
- *Liquid-cooled spindle (ideal thermal stability)*
- *Short acceleration/deceleration times of spindle and axes*
- *Heidenhain CNC control unit*
- *Practice-orientated options, matched to the actual applications*
- *Fully digital drive technology*
- *Huge clamping area*
- *Can readily be upgraded from 3 to 5 axis*



## **Perfect surfaces and high precision.**

**The optimum rigidity and high precision guarantee jig boring quality.**

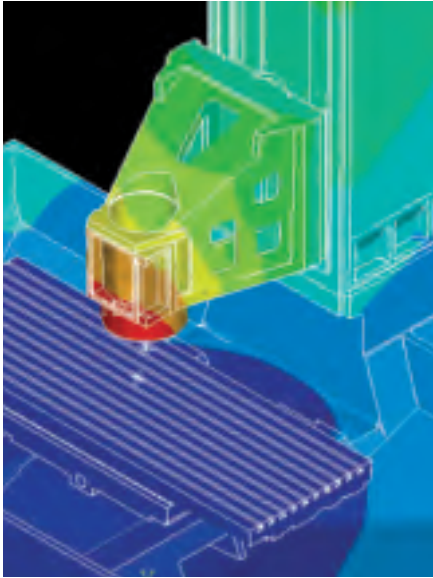




# Development, manufacturing and installation: complete from a single source.

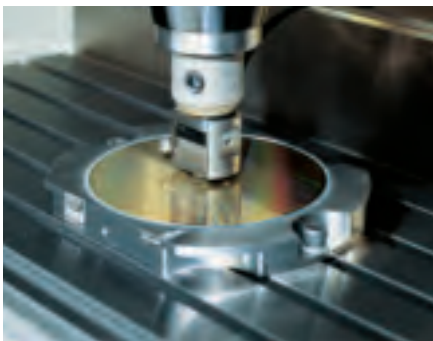
**All machine elements were already tested and optimized during their development as to their future use.**

Guideways, digital drives and motors have been designed and dimensioned in accordance with the latest requirements.



During the production all machine elements will be tested for possible discrepancies by means of latest measuring methods. This guarantees optimal quality during installation.

After the entire process of installation and a predefined trial run, all machines will be calibrated and audited by means of KGM and Laser.



From the development to the fabrication, everything in one location. Qualified and specialised personnel who use their own mind ensure familiar quality of FEHLMANN.



Massive casting base, high rigidity  
The rigid base with its sump, vertical post and machine head are made of a massive vibration-damping casting. The complete machine structure is subject to the same thermal expansion coefficients and thermal conductivities.

# Ergonomic design enables ease of access to all machine features.

## Preferably short shutdown periods during changeover due to accessibility, ergonomics and modularity.

A machine must be accessible and being utilized multi-functional. The PICOMAX 95 accomplishes these criteria in multipurpose aspects.

The large door simultaneously opens the access to the machining area from the front and from the top. For this reason heavy parts will get lifted effortlessly with a crane into the conditioning room.



The serial supplied handwheel and the ergonomically arranged height of the working table guarantee optimal ease of use. Spindle, control, workpiece and toolchanger are well designed within reach of the operator.



Perfect access from the side too. The PICOMAX 95 will get ideally automated like the smaller PICOMAX 60/90. Automation can also get retrofitted. According to requirements, pallets from up to 400x400 mm can get automatically loaded and unloaded.

*Please ask for our special brochure.*

Due to the generous clamping surface, complex 5-axis parts will get finished equally well as voluminous 3D-working parts.





# FEHLMANN spindle options ensures maximum spindle speed and torque for multi purpose machining.



**Whether turning moment or rotation speed for HSC-cutting, with this spindle one is coped with all tasks.**

The heart of the PICOMAX 95 is the Fehlmann HSK-A63 motor spindle offering either 14'000 or 20'000 rpm, that has specially been developed on proven concept for this machine. The active spindle cooling ensures optimum thermal stability. Larger as well as smaller tools can also be deployed for materials that are difficult to process.



**Our own motor spindle fabrication.**

All from one source. More than 1000 reliable and universal Fehlmann spindles are meanwhile in use of a multiplicity of satisfied customers.



# Accessibility to the tool change magazine enhances productivity.

**During the work process the tool magazine can get easily operated from the front.**

The compact but generous tool-changer is equipped with a chain magazine and a double gripper. The machine front door opens the entrance of the tool magazine. A double gripper subsequently inserts the tools quickly and securely into the spindle.



The integrated chain magazine inside the machine contains selectively 46, 72 or 100 tools. With an extension of the magazine there will be actually 226 tools available for the operator.



**At any time quickly within reach.**

The additional magazine is situated behind the machine and can easily be equipped prime-time parallel. The separate operating panel guarantees ideal ease of use and cares for high reliability. The tools will be turned over with a gripper out of the additional magazine to the chain. From this moment on it abides in the chain and will therefore avoid long downtimes.



# Control and software: Simply versatile, from HSC to factory programs.

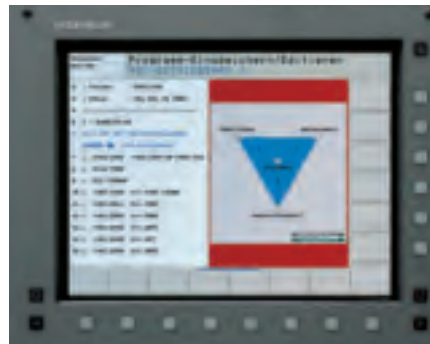


The fully digital Heidenhain control is equipped with the Heidenhain options 1 and 2, (functions for 5-axes manufacturing and fast HSC-milling), the electronic hand wheel as well as the HSC-Setup™ developed by FEHLMANN.

In series integrated machining cycles, graphic assistance, built in hard disk and a fast block processing time contribute to all workshop requirements of a PICOMAX 95. From the simple mechanical component, that is directly programmed on the machine, to the complex hardened form-section and up to the 5-axes machining.



Graphic simulation of the machining process



"HSC-Setup™" Using this cycle, the machine may individually be tailored to the customer's specific machining tasks.



- Free contour programming for insufficiently dimensioned contours.
- Heidenhain interactive programming and also DIN/ISO programming possible
- Swivelling cycles support the programming of the dividing / swivelling attachment.
- Handbook
- Integrated hard disk for the memorisation of 3D programs of almost unlimited length.
- Fast-Ethernet network interface for high-speed data transmission from external programming stations.
- New FEHLMANN specific diagnosis system for fast troubleshooting.
- DXF-converter for adoption of DXF-contours (optional)

Please ask for the detailed control unit brochure.



# Simultaneous 4/5 axes control complete with integrated 4/5 axes rotary tables.



## Designated from the very beginning for 5 axes.

Geometry and configuration of the machines are designed for 5 axes machining. With the great Z-traverse path it is possible to construct even bulky workpieces without problem. The 4th or 5th axes will be fully integrated in the control and can anytime be reconditioned. User-specific there are multiple models available. In addition long parts or a swing bridge can get stabilized by means of a counterpeak application.



## 4-axes manufacturing

To be used horizontally with pneumohydraulic spindle clamping. Ultracompact, high-precision dividing attachment for automatic dividing, circular and helical milling, etc.

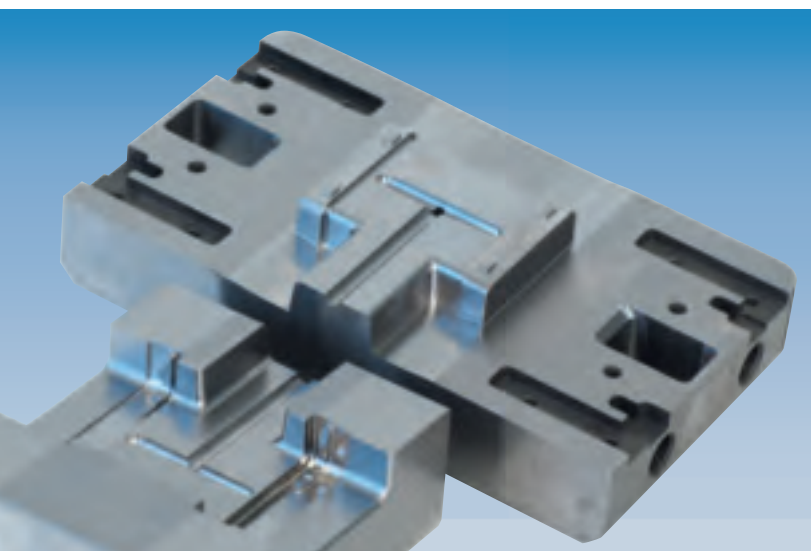
AT 125 = 125 mm  
Centre height



## 5-axes manufacturing

With pneumo-hydraulic clamping of both axes which can be controlled simultaneously or just be used as positioning axes. Very compact, solid and high-precise. For fully automatic dividing, circular and helical milling processes, etc. The swivelling axis is fitted with double clamping. Positioning measure via direct measuring system at swivelling axis for ATS 160 CNC and at dividing and swivelling axis for ATS 200 CNC.

ATS 160 = 160 mm  
Centre height  
ATS 200 = 200 mm  
Centre height



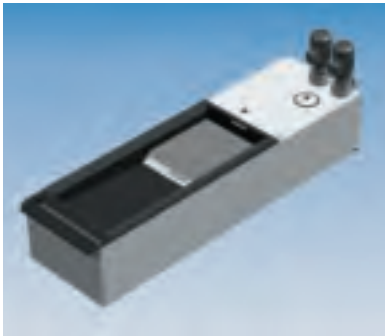
# Coolant equipment for all needs ...

## FEHLMANN offers multiple coolant equipments to meet diverse requirements.

The quotation ranges from the standard coolant equipment with chip container to the high-pressure plant with 80bar internal film cooling, chip conveyor and coolant filter.

### Standard coolant equipment with chip container, consisting of:

Tank content, chip container and workpiece shower.  
Tankage 250 l  
Pump pressure 6 bar



### Coolant equipment with chip container and bag filter, consisting of:

Tank content, chip container, workpiece shower and additional tank with bag filtration.  
Tankage 700 l.  
Pump pressure 6 bar



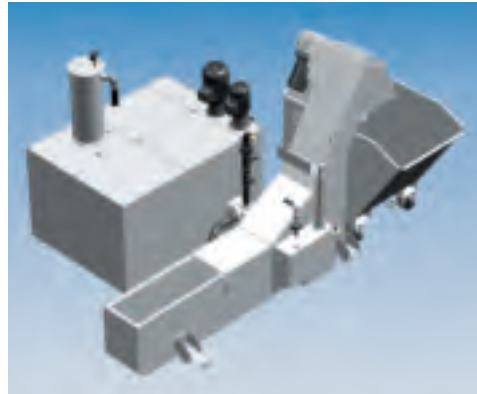
### Coolant equipment with chip container and high-pressure pump, consisting of:

Tank content, chip container, workpiece shower, additional tank with bag filtration and high-pressure pump.  
Tankage 700 l.  
Pump pressure 6 bar.  
High-pressure pump with 40 or 80 bar.



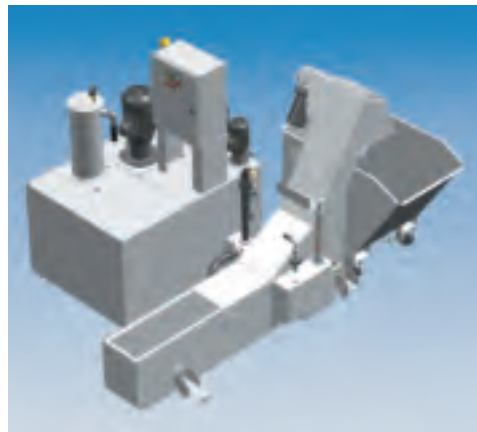
### Coolant equipment with chip conveyor and bag filter, consisting of:

Tank content, chip conveyor, workpiece shower and additional tank with bag filtration.  
Tankage 650 l.  
Pump pressure 6 bar.



### Coolant equipment with chip conveyor and high-pressure pump, consisting of:

Tank content, chip conveyor, workpiece shower, additional tank with bag filtration and high-pressure pump.  
Tankage 650 l.  
Pump pressure 6 bar.  
High-pressure pump with 40 or 80 bar.



### Cooling equipment for coolant media

For enhanced precision requirements while wet processing. With oil especially, the cooling medium can get additionally refrigerated.





## ... and further options for special task adjustments.

### Laser System

For non-contact work piece measurements and tool breakage control directly at the machine. Precise length or diameter measurements in the  $\mu\text{m}$ -range of even the smallest part diameters starting from 0.3 are possible - either stationary or rotating. The measured values are directly stored in the central tool memory of the TNC. The tool is cleaned each time before starting a new measurement.



### Measuring probe

For measuring the tool length and tool radius (single-edge measurement). The measuring values are automatically stored in the central tool memory via the TNC control unit. The measuring probe also allows an efficient tool breakage control.



### Enhanced power-save function

Automatic standby mode of machine drives after processing the NC-programs. Re-start of the system automatically via electronic timer. This allows an unattended warming-up of spindle and axes.



For the machining of graphite parts, an efficient exhaustion/disposal system can be integrated. The re-equipment for the machining of graphite is possible within no time.



### 3D probe system

with infrared signal transmission to register the part zero point and for part measurement functions. Automatic eccentricity compensation thanks to 360° radiation.



### Visiport rotation window

Will be mounted on front window of the machine. When processing with coolant water the Visiport guarantees clear sight into the machining room.



### Minimal Lubrication System

Economical cooling and lubrication system. Perfect for milling or high-speed cutting of materials such as aluminium, copper and hardened steels. The device is equipped with 2 nozzles and is controlled via M-functions.

### Swivelling board

For the storage of measuring tools, work pieces, etc., including holders for 10 tools.

### Drawers (standard)

Generously dimensioned drawers integrated in the base allow order, neat arrangement and fast access.



## Technical data PICOMAX® 95

### Travels

Travel X	mm	800
Travel Y	mm	500
Travel Z	mm	610

### Table / work area

Clamping area (length x width)	mm	1600x550
--------------------------------	----	----------

T-slots: (width / spacing / number)		12-H8 / 50 / 10
Distance between table and spindle nose	mm	160-770
Horizontal load	mm	535
Max. table load	kg	600

### Spindle

Tool adapter		HSK A63
Repeat accuracy	mm	0.002
Speed range	min <sup>-1</sup>	50-20000
Spindle power at S1 (100% ED)	kW	18.5
Spindle power at S6 (40%ED)	kW	24.0
Max. spindle torque at S3 and rated speed	Nm	120
Rated Speed	min <sup>-1</sup>	1920

### Tool changer

No. of tool pockets standard		46
No. of tool pockets optional		72 / 100 / 226
Max. tool diameter without free tool pockets	mm	Ø 80
Max. tool diameter with free tool pockets	mm	Ø 160
Max. tool length (from spindle nose)	mm	350
Tool changing time	sec	approx. 2
Average changing time chip-to-chip	sec	approx. 4
Tool weight	kg	5

### Feed drivers

Digital AC drive with AC-motors	mm/min	X 30000	Option 48000
Feed rate in X / Y / Z		Y 30000	48000
		Z 30000	30000

### Positioning tolerances according to VDI/DGQ 3441

Position tolerance P	mm	0.005	Option 0.003
Positioning range Ps	mm	0.003	0.002

### Measuring system / Resolution

Direct measuring system with glass scale	mm	0.001
Resolution in X / Y / Z		
Compressed-air inlet		incl.

### Electric connections

Operating current and frequency	V/Hz	3x400/50
Power input ( apparent power)	kVA	42
Mains fuse	A	63 AT
Control current	V	24 DC
Operating pressure of pneumatic system	Bar	6

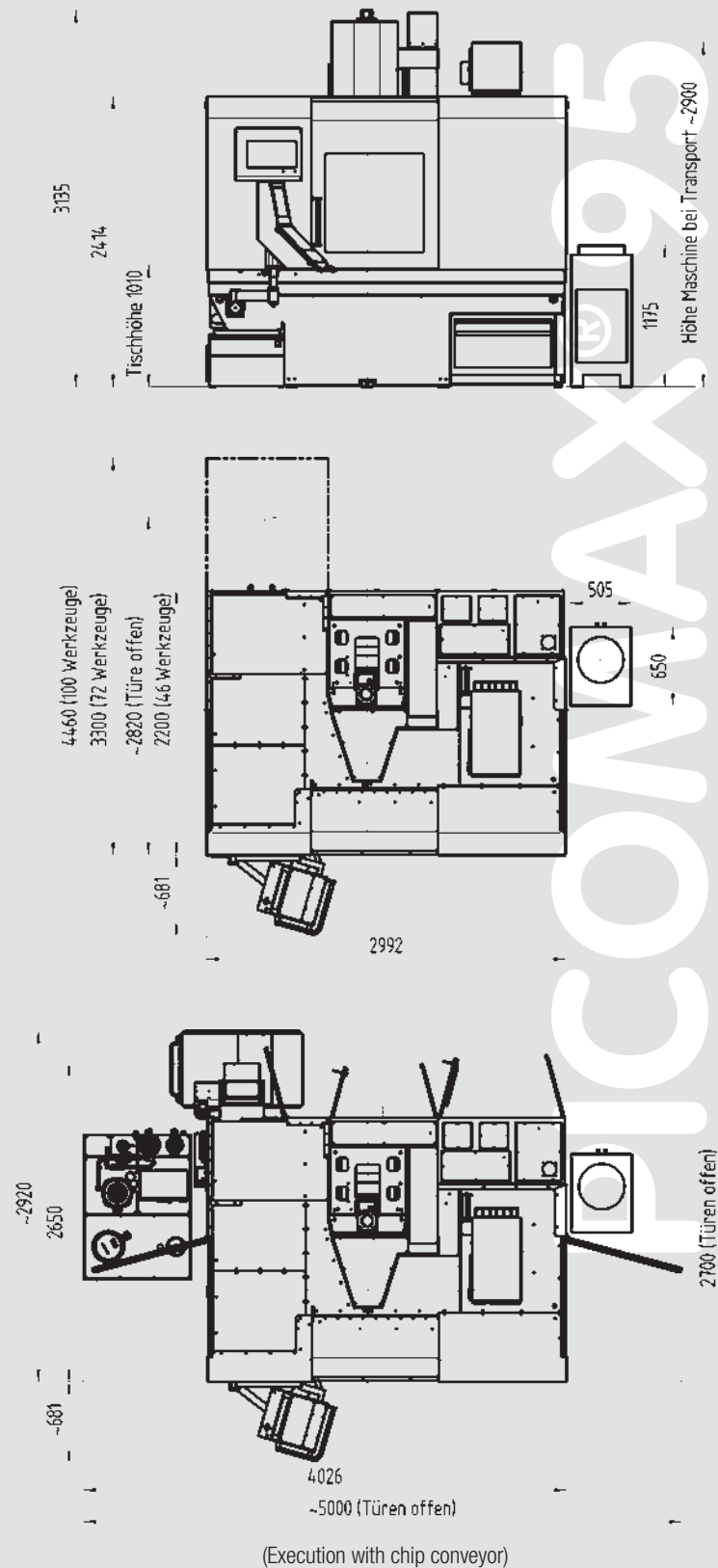
### Weight

Weight of machine tool (excluding coolant equipment)	kg	~ 9100 / 46 tools
		~ 9400 / 72 tools
		~ 9800 / 100 tools

Subject to technical modifications.

PICOMAX® 95

## Dimensions PICOMAX® 95

FEHLMANN Automation  
24 hour operating efficiency.

More and more often, the 'time to market' becomes a critical survival factor for today's parts manufacturers and tool makers. In even shorter time intervals, new products are developed and produced. By using the unmanned night-shift hours, the machine capacity is increased and cycling times are reduced. The investment costs start to amortize immediately. With a FEHLMANN automation solution, you may make this approach come true. But that's not all. The Milling Center Manager allows for keeping up the flexibility to produce single parts also in automatic operation.



Of course, you will receive everything from a single source for these systems as well: Consulting, production, delivery, training, commissioning and service.



The experience in practical operation.

FEHLMANN AG  
MASCHINENFABRIK, BIRREN 1, 5703 SEON / SWITZERLAND  
TELEFON +41 62 769 11 11, FAX +41 62 769 11 90  
mail@fehlmann.com, www.fehlmann.com

*Guards could have been removed for better illustration. Subject to technical modifications.*

Made in Switzerland

FEHLMANN