

# KUNZMANN®

## FRÄSMASCHINEN

WF 610 CNC

UNIVERSAL TOOL MILLING MACHINE



[KUNZMANN-FRAESMASCHINEN.DE](http://KUNZMANN-FRAESMASCHINEN.DE)

**VERSATILE**

KUNZMANN's WF 610 CNC is a flexible all-rounder for milling and drilling tasks in complex part production and 3D processing.

**UNIVERSAL**

In addition to the operational modes "Automatic", "Setup", and "Intervening", you may also use the "Manual Mode" and thus turn the WF 610 CNC into a manually operated machine:

The perfect solution for efficiently processing single parts in the conventional way.

**SOLID**

The WF 610 CNC is based on an FEM-optimized cast construction with linear guideways. This guarantees high stability and optimized dynamics and speeds at the same time.

**OPERATOR-FRIENDLY**

The WF 610 CNC design is tailored to the operator – a machine built by practitioners for practitioners.

**COMPACT**

The WF 610 CNC is a compact machine and requires only a small installation space.

**SUSTAINABLE**

Additional tools, such as the KUNZMANN StateViewer, make the WF 610 CNC a state-of-the-art machine for digital training and interconnected manufacturing.

**PRODUCTIVE**

A fast tool changer that can be loaded during machining, the optional high-speed motor spindle, and internal cooling through the spindle give the WF 610 CNC a productivity level that has yet to be matched.



↑ WF 610 CNC with SIEMENS SINUMERIK ONE

## LINEAR GUIDANCE – HIGH DYNAMICS

### LINEAR GUIDEWAYS

- ▶ Linear guideways for higher dynamics and precise positioning: Using them in all axes guarantees harmonic machine motions and consistently high accuracy.
- ▶ The outstanding running smoothness allows for the slightest simultaneous movements of several axes.
- ▶ Wide guidance distances provide for additional stability.
- ▶ Low guideway wear results in high long-term accuracy and long lifetime – The requirements for efficient processing strategies, such as trochoidal milling.

### PERFECT PRECISION

- ▶ Absolute linear encoders and ground ball screws in all axes for precise positioning and high repeatability
- ▶ The modern gearless machine construction with direct drives reduces heat input to a minimum – yet again improving repeatability and workpiece surface quality.
- ▶ Electronic temperature compensation of the Y axis ensures outstanding detail accuracy



## ERGONOMICS

Everything in the right place: At KUNZMANN, operator convenience has always been the focus of design. Operating elements are perfectly positioned and the operator finds them intuitively.

- ▶ Perfect access to working area due to two large angled slide doors
- ▶ Direct table access by crane
- ▶ Clamping table can be positioned vertically to reach the ergonomically perfect height for loading
- ▶ Optimum view on working area from different angles through large windows
- ▶ Rotatable control panel and electronic handwheel support operator in setup and retooling
- ▶ Service-friendly arrangement of maintenance-relevant components

## CONVENIENCE FUNCTIONS

### Maintenance time monitoring

The machine control monitors and timely reports due maintenance services to avoid malfunctions and provide for a high machine availability.

### Manual operation mode

Use the functionality of a manually operated machine – even with open cabin doors:

- ▶ Axis direction keys
- ▶ Incremental jog function
- ▶ Electronic handwheel
- ▶ Positioning function
- ▶ Quill for manual drilling (with milling head only)

### ATC-Stop (Automatic Tool Change Stop)

(with automatic tool changer only)

- ▶ Program stop before next automatic tool change
- ▶ Activation via softkey at any time
- ▶ Retraction of milling spindle to manual tool change position

Fields of application:

- ▶ Tool control after processing
- ▶ Tooling plate change after processing
- ▶ Chip removal

## ENERGY-EFFICIENCY / SUSTAINABILITY

The WF 610 CNC is manufactured focusing on a sustainable use of energy and resources. That is why we work in accordance with the certified Environmental Management System ISO 14001:2015.

- ▶ Our machine has a highly-efficient drive system.
- ▶ Temperature-regulated ventilators reduce energy consumption and noise generation.
- ▶ The automatic standby mode shuts down inactive units and functions.
- ▶ The operator can define individual turn-off times for certain functions.
- ▶ Energy recovery is optional.





## SIEMENS SINUMERIK ONE

High-end control with 19" screen and comfortable KUNZMANN manual control panel

Machine operation reaches a new comfort level thanks to the haptic powerride potentiometer with visual display. Highly ergonomic working is guaranteed by the angled and rotatable control panel. The electronic handwheel supports the operator in flexibly setting up and retooling the machine.



## HEIDENHAIN TNC7 BASIC

Compact control with 19" screen and intuitive control panel

HEIDENHAIN's TNC7 BASIC allows for an intuitive machine operation via clearly structured and context-sensitive user interfaces and softkeys for frequently used functions. The electronic handwheel HR 510 FS supports the operator in setting up and retooling the machine.



## HEIDENHAIN TNC7

High-end control with large 24" screen, extensive keyboard, and integrated track ball

Ergonomic machine operation is guaranteed by the angled and rotatable control panel. The large screen makes the individual configuration of the HEIDENHAIN interface highly convenient. The electronic handwheel HR 510 FS supports the operator in setting up and retooling the machine.



### MILLING HEAD

- ▶ This robust all-rounder is a powerful basis for numerous types of operations. Flexibility is guaranteed by the extendible quill and the option to swivel the milling head.
- ▶ Spindle speed: up to 5,000 rpm
- ▶ Swivel range: from  $-5^{\circ}$  to  $+90^{\circ}$
- ▶ Torque: up to 85 Nm
- ▶ Performance: up to 10.5 kW



### MOTOR SPINDLE

- ▶ Dynamics and precision at any spindle speed and with minimum noise generation make the motor spindle the state-of-the-art solution for innovative operating procedures.
- ▶ Ceramic bearings for maximum running smoothness and precision
- ▶ Spindle speed: up to 12,000 rpm
- ▶ Torque: up to 51 Nm
- ▶ Performance: up to 12 kW

## CHIP MANAGEMENT

KUNZMANN ensures comfortable chip management with the special design of our full protection cabin: Smooth interior surfaces and a funnel on the cabin bottom directly transport milling chips into the chip tray or onto the chip conveyor.

### Coolant tank with chip tray (standard)

Tank for collection of chips and coolant underneath the machine

### Slat-band conveyor

- ▶ Homogenous separation of various chip materials
- ▶ Especially recommended for processing with different chip types and large chip volumes
- ▶ Space-saving due to steep chip ejection

### Chip trolley

- ▶ Capacity: 0.4 m<sup>3</sup>
- ▶ Emptying on ground level
- ▶ Equipped with fork lift slots and coolant outlet

### Rinsing gun for cleaning (standard)

Coolant gun for cleaning workpieces and machine interior of chips and milling dust

## INTERNAL COOLING

### Coolant through spindle – 25 / 40 bar

This function optimizes tool life and chip drainage: A nearly maintenance-free metal-edge filter automatically separates floating chips from the coolant. The compact design only requires little machine space.

### External / internal air cooling

- ▶ Programmable blast air for dry processing

## SUCTION UNIT

### Emulsion mist suction for long processing times

- ▶ Highly efficient five-step pre-separation with a self-cleaning long-life baffle plate separator
- ▶ Option: connection to central system



## OPTIONS

### TOOL CHANGER

Fast 20-pocket tool changer with flexible tool positioning and the option to reload during processing: While the machine is working until the next tool change, the operator can already insert new tools.

### UNIVERSAL TILTING-SWIVELING TABLE

The universal tilting and swiveling table allows you to position the workpiece in different angular positions. Adjustment is done manually with the rotation angle of the clamping plate being indicated on a digital readout.

### CNC DIVIDING HEAD

With a CNC dividing head, you may easily process workpieces multilaterally. Programming is done via the 4<sup>th</sup> axis of the control.

### TOUCH PROBE SYSTEMS AND AUTOMATIC TOOL MEASUREMENT

Combined with the probing cycles of the control, triggering 3D touch probe systems facilitate setup, measuring, and monitoring during manufacturing. Specific control cycles are used to automatically measure tool length, tool radius, and tool wear with a matching probe.

CNC dividing head (1), tool changer (2), touch probe system and automatic tool measurement (3)



### AUTOMATIC FEED REDUCTION AFR\*

With the special KUNZMANN software, the control constantly monitors the spindle load during operation. If the set load is exceeded, AFR automatically and gradually adjusts the feed rate.

Advantages of AFR:

- ▶ Individual spindle load setting for each tool
- ▶ Tool monitoring protects spindle and machine mechanics
- ▶ Prevents damage to tool, work piece, and machine/spindle due to an overload

### CONTROL MEDIA POINT CMP

All important machine documentation is digitally available in the control:

- ▶ Operating instructions
- ▶ Control manuals
- ▶ Electric circuit diagram
- ▶ Electric partlist / mechanic partlist
- ▶ KUNZMANN video tutorials

### OPTIMIZED CONTOUR MILLING OCM\*

OCM facilitates trochoidal milling. This highly dynamic milling strategy with a large chip volume is a procedure with considerably reduced processing time and tool wear.

\*) with HEIDENHAIN control only

### KUNZMANN STATEVIEWER PREMIUM

KUNZMANN StateViewer is our PC software solution for digitalization and interconnection of machines and factory equipment.

#### StateViewer functions:

##### Cockpit

- ▶ Display of current machine information, actual machine state, and process data
- ▶ Help request / messenger functions
- ▶ (Group) individual licensing of machine access

##### Information Desk

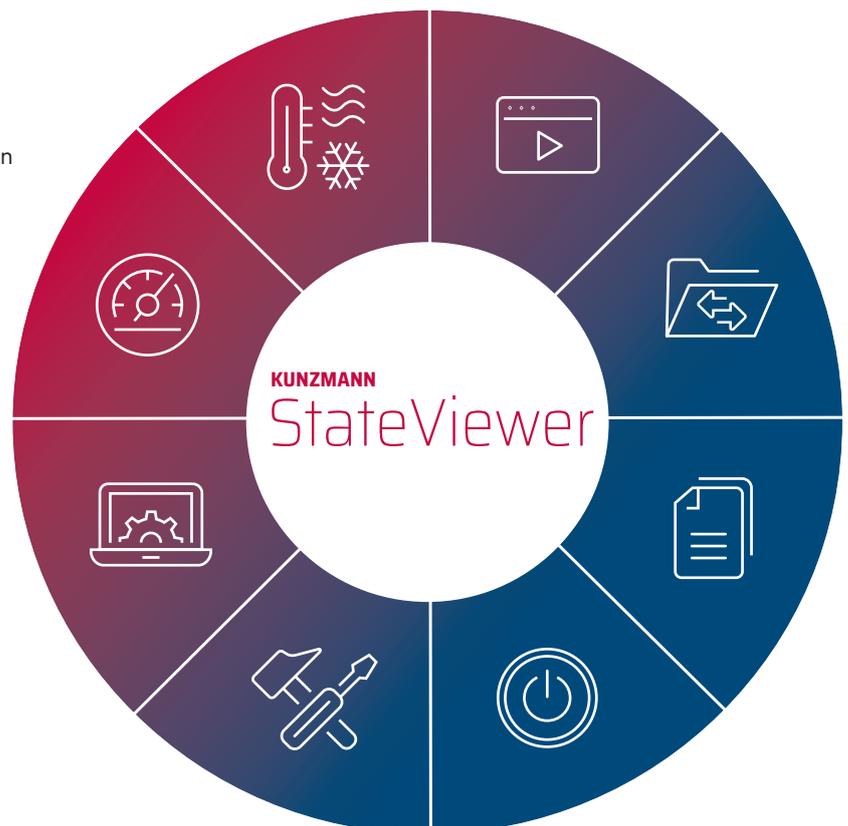
- ▶ All important information on a single click

##### Service Manager

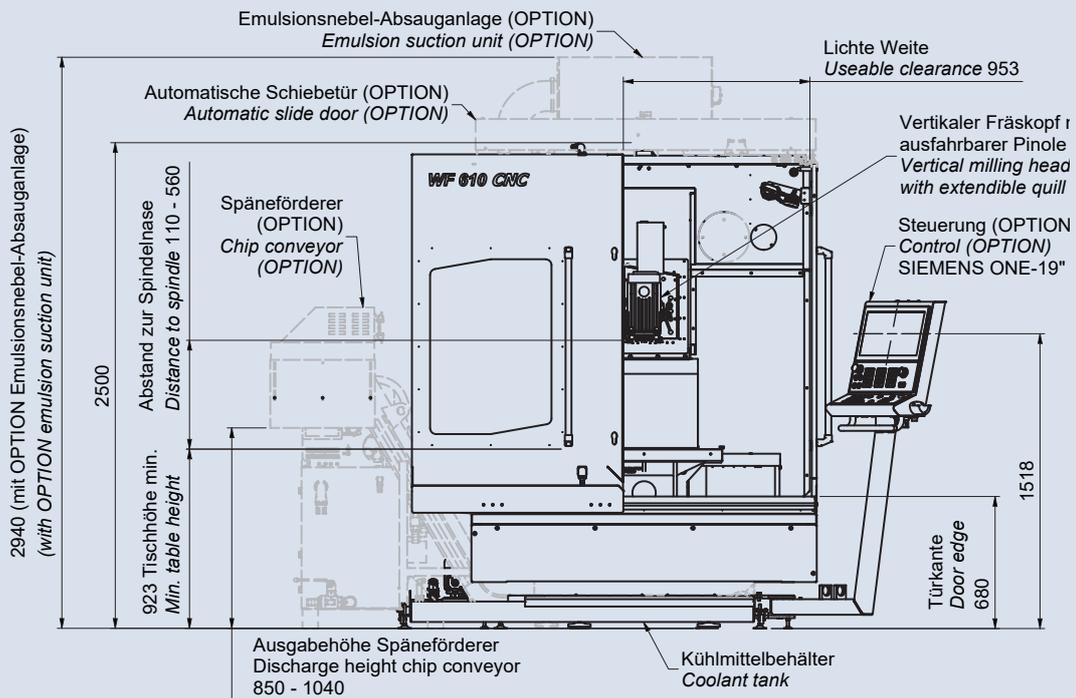
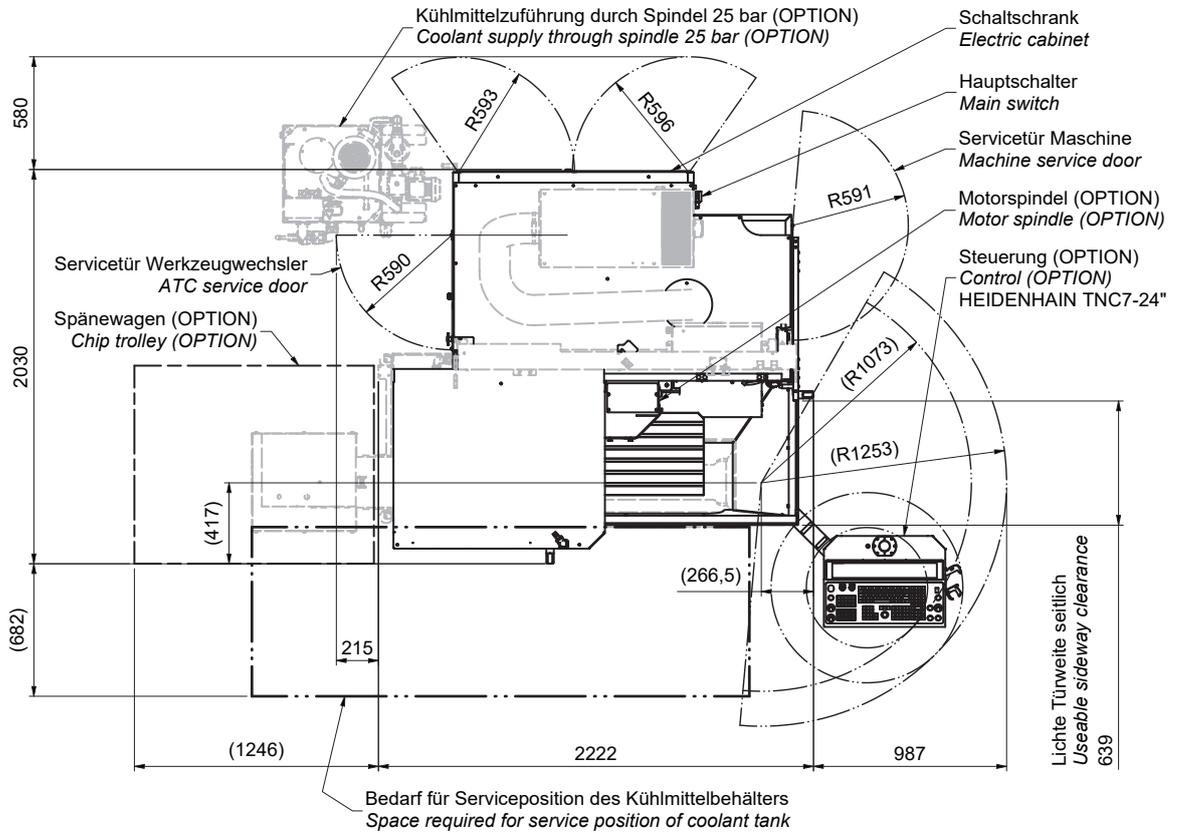
- ▶ All-in-one: error messages, maintenance status, services shop, wear and spare parts
- ▶ Creation of service file and service request on a single click
- ▶ Automatic maintenance log for each machine (with manual entry option)

##### Offline Functions

- ▶ Organization and Information Desk for additional machines and equipment



# LAYOUTS



## STANDARD EQUIPMENT

- ▶ Vertical milling head with quill
- ▶ FEM-optimized cast construction with linear guideways in all axes
- ▶ Temperature compensation of Y axis
- ▶ Ground ball screws
- ▶ Electronic handwheel
- ▶ Full protection cabin with 2 slide doors
- ▶ Rigid angular table
- ▶ Coolant tank, free-standing, 80 liters
- ▶ Leveling elements
- ▶ direct drive units

## OPTIONS

- ▶ Motor spindle
- ▶ Tool changer
- ▶ Slat-band chip conveyor
- ▶ 25-bar internal cooling
- ▶ Suction unit
- ▶ Linear encoders
- ▶ Touch probe systems
- ▶ Dividing heads
- ▶ Universal tilting-swiveling table
- ▶ Automatic sliding door of the cabin
- ▶ KUNZMANN StateViewer PREMIUM

<b>Working range</b>	longitudinal, X axis	610 mm	
	cross, Y axis	400 mm	
	vertical, Z axis	450 mm	
<b>Main drive</b>			
	*at 1,500 rpm	perf. at 100% of duty cycle*	5.5 kW
	**at 2,000 rpm	perf. at 25% of duty cycle*	10.5 kW
<b>Milling head</b>			
		perf. at 100% of duty cycle**	8 kW
<b>Motor spindle</b>			
		perf. at 25% of duty cycle**	12 kW
<b>Spindle speed</b>	Milling head	5,000 rpm	
	Motor spindle	12,000 rpm	
<b>Swiveling range</b>	Milling head	-5°/+90°	
<b>Vertical quill</b>		70-mm stroke	
<b>Feed</b>	X and Y axis	30 m/min	
	Z axis	15 m/min	
<b>Tool taper</b>	Milling head / motor spindle	SK 40 DIN 69871	
	Milling head	HSK 63-A DIN 69893-1	
<b>Tool changer</b>	Pockets	20	
	Change time	3 s	
	Chip-to-chip time	11 s	
<b>Angular table</b>		800 x 425 mm	
<b>Universal tilting-swiveling table</b>	rotational angle digitally indicated	650 x 395 mm	
<b>Control</b>	HEIDENHAIN	TNC7 BASIC 19"	
	HEIDENHAIN	TNC7 24"	
	SIEMENS	SINUMERIK ONE	
<b>Operating voltage</b>		400 V / 50 Hz	
<b>Power consumption</b>		18 kVA	
<b>Installation weight</b>		approx. 2,550 kg	
	with tool changer	approx. 3,150 kg	



Visit our Website

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