

# KUNZMANN® FRÄSMASCHINEN

WF 410 MC  
WF 610 MC

UNIVERSAL MILLING MACHINE



## UNIVERSALITY

The main spheres of application for the WF 410 MC and the WF 610 MC are training as well as the manufacturing of individual parts and small series. These modern, conventional and CNC-operated universal milling machines are outstanding in their high productivity, maximum precision and simple handling. Even in the basic version, the machines have mechanic handwheels which can easily be operated without prior cutovers.

The vertical milling head has an extending quill and can quickly be swiveled through  $\pm 90^\circ$ . For horizontal machining, the vertical milling head can be swiveled to one side on a swivel arm in a few simple steps, freeing the horizontal milling spindle, and permitting milling with or without an arbor holder and long milling spindle.

In place of the rigid angular table, the WF 410 MC and WF 610 MC can also be equipped with a universal tilting and swiveling table including a digital readout.

## HIGH PERFORMANCE

Modern, high torque drives as well as a solid machine column with hardened flat guideways also make it possible to process materials that are difficult to machine. Spindle speeds and feed rates can be steplessly adjusted via potentiometer.

## MAXIMUM PRECISION

Due to the steplessly adjustable single feed drives and backlash-free ball screws, the WF 410 MC and WF 610 MC permit exact positioning and effortless up- and down-milling.

In addition, the machines have linear path measuring systems in all axes.

Automatic axis clamping through the feed motor brakes ensures operational safety and guarantees a consistently high long-term accuracy of the machine geometry.

## SAFETY TECHNOLOGY

- ▶ Compliance with European standards
- ▶ Direct monitoring of all safety components and functions by safety-related control
- ▶ **KUNZMANN uses:**
  - HEIDENHAIN: Functional Safety**
  - SIEMENS: Safety Integrated**
- ▶ Access to working area is secured by diversity safety switches
- ▶ Electronic overload monitoring of axis and spindle overload
- ▶ In compliance with Machine Directive 2006/42/EC

## CONVENIENCE FUNCTIONS

### ▶ MONITORING OF MAINTENANCE TIMES

The machine control monitors and reports coming due maintenance services. The report of important maintenance requests avoids machine malfunctions and guarantees a high machine availability.

### ▶ AFR – AUTOMATIC FEED REDUCTION\*

The control constantly monitors the spindle load during operating. If the set load is exceeded, the AFR automatically and gradually adjusts the feed rate.

Advantages of AFR:

- The maximum spindle load can be set for each tool individually.
- The tools are monitored, which conserves the spindle and machine mechanics.
- Damage to the tool, the work piece, and the machine/spindle due to an overload is avoided. This ensures machine availability.

### ▶ ORIENTATED SPINDLE STOP

Machine and control allow thread cutting without compensating chuck

## MANUAL AND CNC OPERATION

You can switch from manual mode to CNC mode by key switch. So you can choose between **4 operating modes** using two **key switches**.

The operator's key management guarantees that only qualified operators can call the respective operating modes.

### 1. Automation

Full contouring Heidenhain TNC 620 or SIEMENS 840D sl control functions

\* In combination with Heidenhain control

# HYBRID ALL PURPOSE MACHINE



↑ Right side door open, operation with mechanical handwheels and 3 axis digital readout

## 2. Setup

Axes can be moved separately and milling spindle can be activated (with doors open, if enabling switch is pressed)

## 3. Intervening

Axes can be moved simultaneously and milling spindle can be activated (with doors open, if enabling switch is pressed)

## 4. Manual Mode

You can operate the machine like a manual milling machine with a digital readout. In addition, you can use the KUNZMANN positioning function (with active digital readout). This includes entering and travelling the positioning block. Furthermore, you can use the quill for manual drilling operations.

Due to the secure manual control panel (with dual-channel buttons), you can also use the functions with open doors and without permanently pressing the enabling button.

When operating in the manual mode, the contouring control automatically reduces its functions to a 3 axis digital readout. This allows prompt processing of simple milling operations without programming knowledge (i.a. with open cabin doors).

In the CNC mode, the operator can use the machine with all the functions of a state-of-the-art dialogue contouring control on a large screen and with various programming cycles as well as graphical support.

**► SIEMENS 840D sl**

High-end control with multitouch screen, KUNZMANN manual control panel, and dual-channel key polling. The bent and pivotable control desk allows ergonomic working. The electronic Mini-BHG handwheel supports the operator in setting up and retooling the machine.

**► HEIDENHAIN TNC 620**

Compact control with various functions. The operator works on a large multitouch display and a machine control panel in the front. The handling is easy due to well-structured and context-sensitive user interfaces and softkeys for frequently used functions. The electronic HR 510 FS handwheel supports the operator in setting up and retooling the machine.



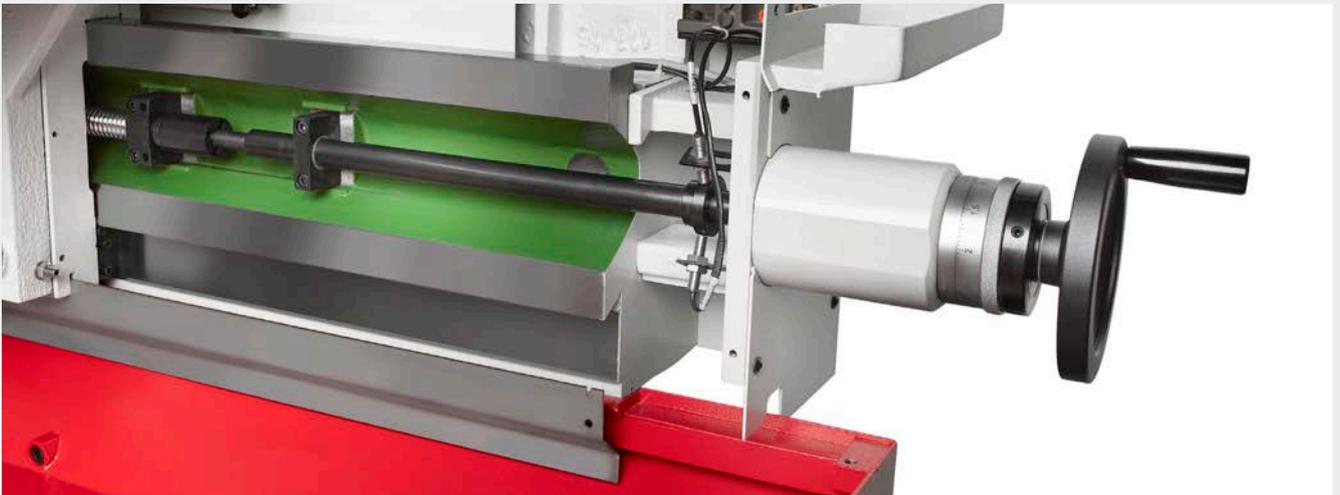
# SAFETY AND TIDINESS

## MECHANICAL SAFETY HANDWHEELS

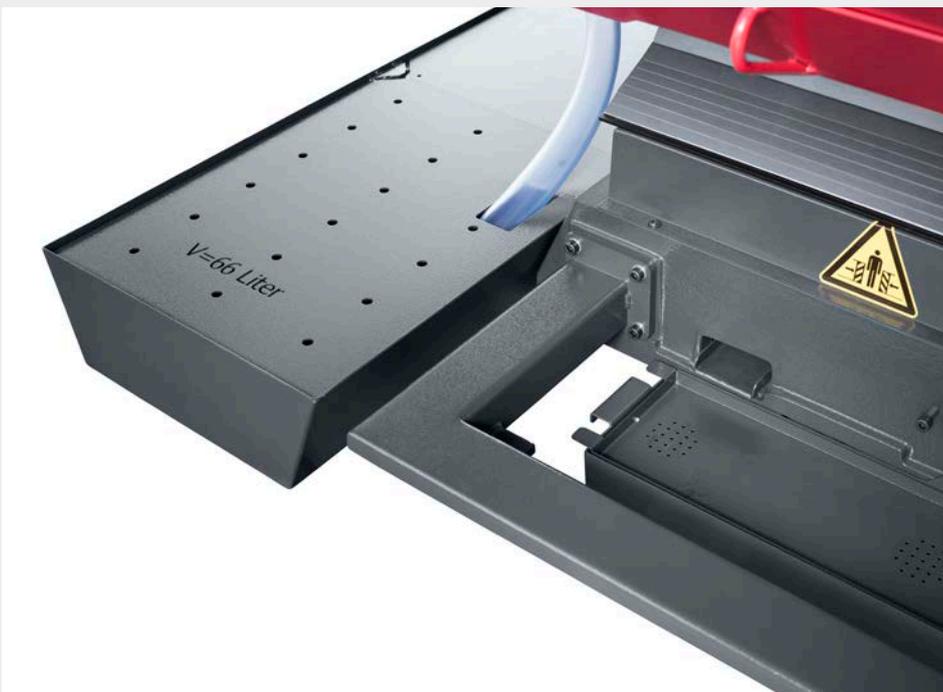
The machine is equipped with mechanical handwheels for manual operations. The ergonomic position of the handwheels guarantees ideal access to and view on workpieces. As soon as a handwheel is activated, "Handwheel X/Y/Z axis active" is displayed and, for safety reasons, you cannot move the machine via the axis selection buttons anymore. The axes are automatically in a safe position, e.g. STO (Safe Torque Off).

## OIL DRIPPING PAN

Track oil is directly drained due to the special KUNZMANN design. The machine base thus remains clean and oil-free. This reduces the risk of contamination and accidents around the machine. At the same time, the coolant durability is prolonged, as oil and coolant are drained separately. The collected oil can easily be taken and disposed of from the oil dripping pan.



↑ Mechanical handwheel X axis



← Oil dripping pan and coolant tank

### ARBOR HOLDER

The arbor holder is an additional device for horizontal milling. In just a few steps, it is mounted to the upper slide of the machine and allows the efficient use of long cutter spindles with one or more disk milling cutters up to a diameter of 150 mm.

### UNIVERSAL TILTING AND SWIVELING TABLE

The universal tilting and swiveling table allows the operator to position the workpiece in different angular positions. The adjustment is done manually using a handwheel while the rotation angle of the clamping plate is digitally indicated on the display of the control system.

### CNC DIVIDING UNIT

By including a CNC dividing unit, you can process your workpieces from various sides. Programming is done via the 4<sup>th</sup> axis of the control. The dividing unit can be vertically or horizontally fastened on the angular table.

### ELECTRONIC HANDWHEEL

This is a handheld device enabling the operator to get closer to the working area of the machine during set-up or similar procedures. The handwheel housing incorporates axis buttons, buttons for feed rates and control buttons for the machine.

### TOUCH PROBE SYSTEMS

Together with the probing cycles of the control system, triggering 3D touch probe systems simplifies the setup, measuring and checking functions when manufacturing workpieces.

### AUTOMATIC TOOL MEASUREMENT

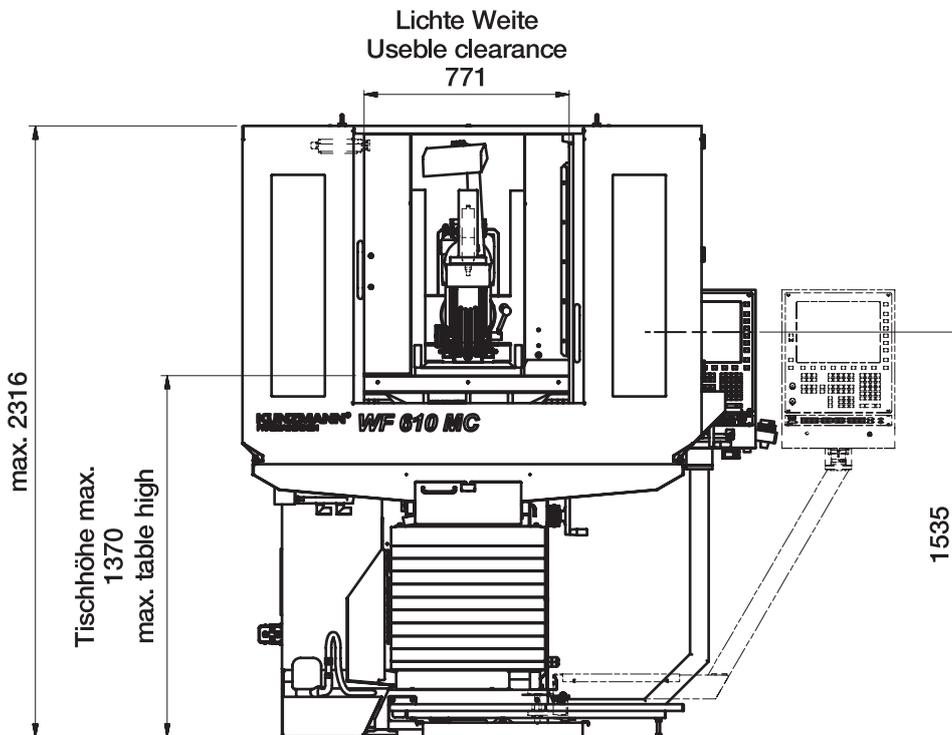
The tool is a vital element in ensuring consistent manufacturing quality. Various control system cycles are used to automatically register tool parameters such as the exact tool length, tool radius and even tool wear.

CNC dividing unit (1), arbor holder (2), touch probe system and automatic tool measurement (3)

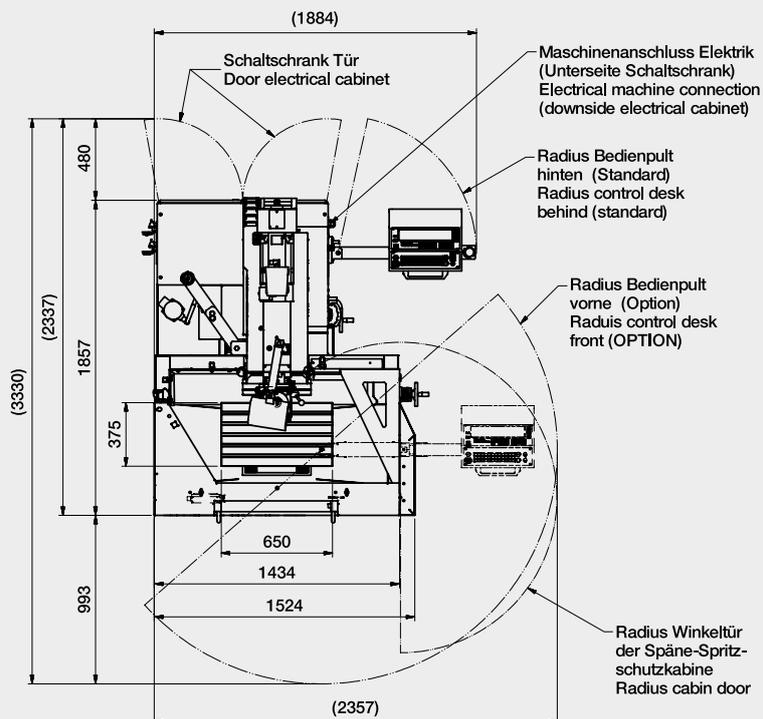


# LAYOUTS

WF 410 MC / WF 610 MC

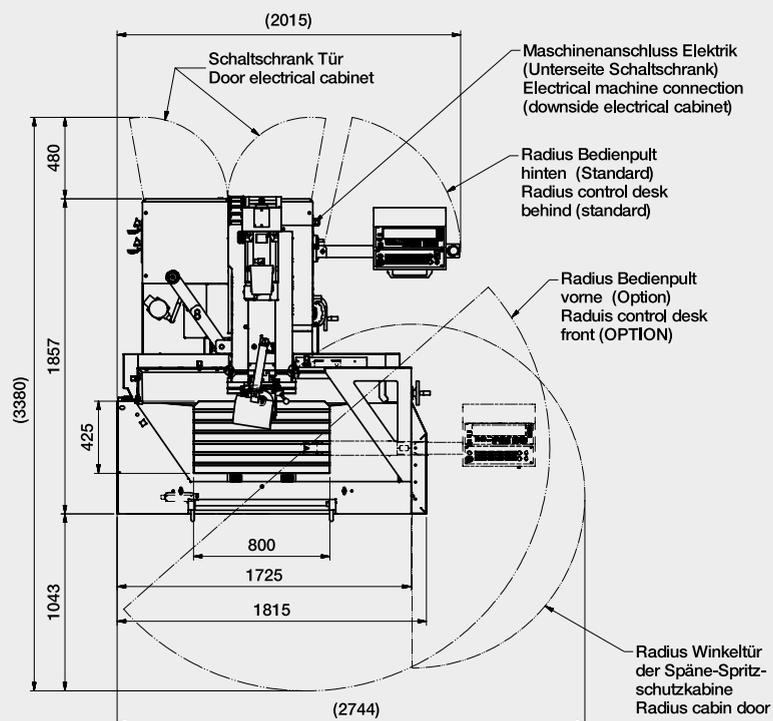


WF 410 MC





WF 610 MC



# PERFORMANCE CHART

## HORIZONTAL/VERTICAL SPINDLE 5,000 RPM

The universal milling machines KUNZMANN WF 410 MC and WF 610 MC are equipped with a two-stage gear box which is shifted automatically. Additionally, the spindle speed in each gear stage is infinitely adjustable through a potentiometer.

### ► Performance

**6.8 kW (100% of duty cycle)\***

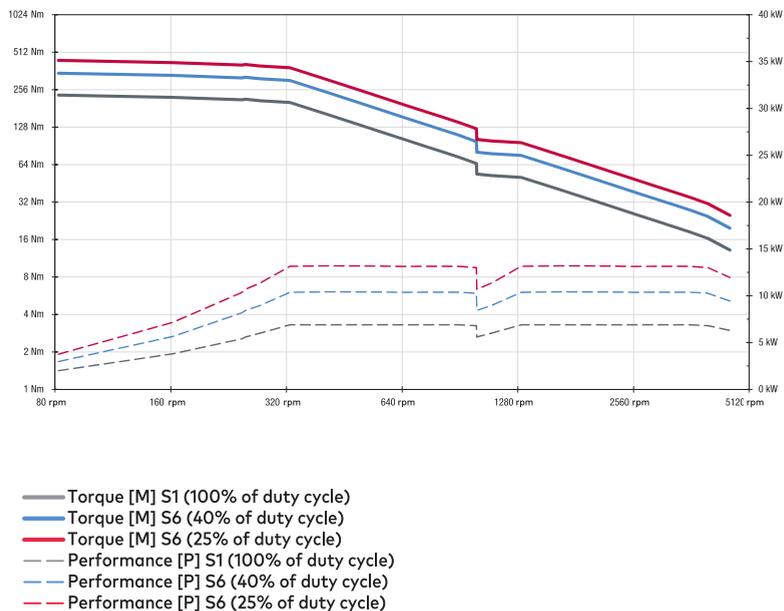
**13.0 kW (25% of duty cycle)\***

### ► Torque

**65 Nm (100% of duty cycle)\***

**124 Nm (25% of duty cycle)\***

\*(at 1,000 rpm)



— Torque [M] S1 (100% of duty cycle)  
— Torque [M] S6 (40% of duty cycle)  
— Torque [M] S6 (25% of duty cycle)  
— Performance [P] S1 (100% of duty cycle)  
— Performance [P] S6 (40% of duty cycle)  
— Performance [P] S6 (25% of duty cycle)



**STANDARD EQUIPMENT**

- ▶ Vertical milling head with extending quill
- ▶ Horizontal spindle
- ▶ Orientated spindle stop
- ▶ Stable cast iron column with flat guideways in all axes (hardened)
- ▶ Ball screws
- ▶ Automatic axis clamping
- ▶ Automatically shifted gear stage
- ▶ Distance-coded linear path measuring systems
- ▶ Mechanical handwheels
- ▶ Automatic central lubrication system
- ▶ Coolant fluid tank, free-standing, 66 liters
- ▶ LED machine light
- ▶ Leveling elements

**OPTIONS**

- ▶ Rigid angular table:  
WF 410 MC: 650 x 375 mm  
WF 610 MC: 800 x 425 mm
- ▶ Universal tilting/swiveling table  
650 x 395 mm (rotating angle digitally indicated)
- ▶ Arbor holder
- ▶ Electronic handwheel
- ▶ Touch probe systems
- ▶ Minimum-quantity lubrication system
- ▶ CNC dividing unit – 4<sup>th</sup> axis

<b>Working range</b>	Longitudinal, X axis	410 / 610 mm
410 MC / 610 MC	Cross, Y axis	350 / 400 mm
	Vertical, Z axis	450 mm
<b>Main spindle drive</b>	Horizontal/vertical spindle	
* at 1,000 rpm	Performance at 100% of duty cycle*	6.8 kW
	Performance at 25% of duty cycle*	13 kW
<b>Spindle speed</b>	Horizontal and vertical spindle steplessly adjustable, 2 mechanical gear stages	1 - 5,000 rpm
<b>Feed drives</b>	AC single drives	
<b>Feed</b>	X and Y axis	5 m/min
	Z axis	4 m/min
<b>Swiveling range of vertical milling head</b>		+/- 90°
<b>Vertical quill</b>	Stroke	70 mm
<b>Tool taper</b>		SK 40 DIN 69871 / 2080 / 7388
<b>Operating voltage</b>		400 V / 50 Hz
<b>Controls</b>	Heidenhain	TNC 620
	Siemens	840D sl
<b>Power consumption</b>		approx. 18 kVA
<b>Machine weight</b>	WF 410 MC	approx. 1,800 kg
	WF 610 MC	approx. 2,000 kg



Visit our website

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