

KUNZMANN®

FRÄSMASCHINEN

BA 1100

BA 1300

BA 1500

VERTICAL MACHINING CENTER



CONCEPT

- ▶ State-of-the-art vertical machining center based on a modular C frame construction, which allows optimum customization
- ▶ Universal use in single and batch production of small and medium lot sizes
- ▶ Spacious and easily accessible working area and clamping table despite compact machine dimension
- ▶ Minor machine height despite large Z axis

CONSTRUCTION

- ▶ FEM-optimized cast components guarantee optimum stability with a reduced machine weight.
- ▶ Large clamping table with 6 transverse T-grooves and grooved surface (groove distance: 100 mm)
- ▶ Modern machine concept that improves stability and inherent rigidity while providing highly dynamic axis movements
- ▶ Large and clearance-free profile roller guideways and ball screws in all axes
- ▶ Standard slat band conveyor with high chip discharge and 38 pocket tool changer

MACHINE ACCURACY

- ▶ Ground ball screws in all axes provide high-precision positioning and repeatability.
- ▶ Constant machine geometry due to thermosymmetric machine construction
- ▶ Actively cooled main spindle and cooled main spindle drive
- ▶ Additional covers over the cast components in the working area reduce coolant and lubricant influence on temperature.
- ▶ The pneumatic adjustment of the counterbalance in the Z axis takes load of the axis drive and reduces the machine's heat input.

ERGONOMICS

- ▶ The working area is easily accessible due to wide front slide doors with large windows.
- ▶ The table can be accessed by crane directly.
- ▶ The movable and height-adjustable control panel and the electronic handwheel facilitate machine setup and retooling.
- ▶ The clamping table has a comfortable height and can be closely driven towards the front doors for loading the machine (**see fig. 1**)
- ▶ The smooth, inclined interior surfaces facilitate chip drain and cleaning.
- ▶ Components that require frequent maintenance are easy to approach.

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
- ▶ Electrical overload monitoring of axis and spindle overload
- ▶ In compliance with Machine Directive 2006/42/EC 

ENERGY EFFICIENCY

- ▶ Time-controlled standby for idle units and functions
- ▶ The operator can configure the individual switch-off times for specific functions.
- ▶ Highly efficient and energy-saving coolant pumps and cooling units
- ▶ Energy-efficient LED lamps provide optimum machine illumination.
- ▶ Temperature-regulated ventilators reduce noise exposure and energy consumption.

OPERATING MODES

- ▶ You can choose between three operating modes using a key switch. Your key management guarantees that only qualified operators can call the respective operating modes:
- ▶ **Automatic:** full CPC functions with closed cabin doors
- ▶ **Setup:** axes can be moved separately and milling spindle can be activated (with doors open, if enabling switch is pressed)
- ▶ **Intervening:** Several axes (interpolant moving) and the milling spindle can be moved simultaneously (with doors open, if enabling switch is pressed). Thus, you can intervene with the program run.



Direct access to working area – long Y travel length of 750 mm



Rapid tool changer – design with belt-driven spindle

SPINDLE TYPES

► BELT-DRIVEN SPINDLE 10,000 RPM

The standard machining center is equipped with a rugged belt-driven spindle.

- SK 40 tool taper

► IN-LINE SPINDLE 14,000 RPM

The directly driven spindle provides high torques and rotational speeds. It is ideal for operations with large chip volumes at low to medium infeed depth and normal traversing speeds.

- SK 40 or HSK 63-A tool taper

► IN-LINE SPINDLE 18,000 RPM

The directly driven spindle provides high torques and rotational speeds. It is ideal for operations with large chip volumes at low infeed depth and high traversing speeds. Recommended for 3D processing and finishing.

- HSK 63-A tool taper

CHIP MANAGEMENT

► SLAT BAND CONVEYOR

For long steel chips, balls of chips, and wool chips as well as short, dry chips at high chip volumes

► REGULATED CHIP BATH RINSING

Adjustable power stages for optimum cleaning of the machine interior; the pump complies with the premium European energy efficiency class IE5.

► RINSING GUN FOR CLEANING

Coolant rinsing gun on the front machine paneling for cleaning work pieces and machine interior

► LATERAL ACCESS TO WORKING AREA

Additional service doors on both machine sides for cleaning and maintenance

CONVENIENCE FUNCTIONS

► MONITORING OF MAINTENANCE TIMES

The machine control monitors and reports coming due maintenance services. Important maintenance services are reported early to avoid malfunctions. This 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.

ADDITIONAL AXES



► CNC DIVIDING UNIT (A OR C AXIS) FIG. ↑

You can flexibly use dividing units of different sizes and types for various operations. The operator can install a dividing unit everywhere on the machine table and demount it as required. The units have a rotation range of 360°.



► CNC DIVIDING UNIT (A / C AXIS) FIG. ↑

The 3 axes machine turns into a 5 axes simultaneous machine when the rotary machine table is installed. You are free to either position the dividing unit on the right or on the left side of the table. The interface is on the side of the machine table, which leaves the working area cable-free. Due to the compact unit size, you can fasten additional tools on the table.

* In connection with Heidenhain control

CONTROLS

► SIEMENS 840D sl

High-end control with 19" multitouch display and large keyboard and control panel. 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 640

High-end control with 19" multitouch display and large keyboard as well as integrated control panel. The bent and pivotable control desk allows ergonomic working. The electronic HR 510 FS 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.



TOOL CHANGER fig. 1

Rapid double-arm changer with short tool change times.
A special feature is the variable tool pocket coding and the cleaning of the tool taper with air every time a tool is changed.

- ▶ **38 positions (standard)**
- ▶ **60 positions**

INTERNAL COOLING fig. 2

- ▶ **Coolant through spindle – 25 bar**
Low-maintenance edge split filter included
- ▶ **Coolant through spindle – 40 bar**
Tool-specific setting of pressure from 25 to 40 bar;
low-maintenance edge split filter included
- ▶ **Internal air cooling**
Air blown through tool

SUCTION fig. 3

- ▶ **Low-maintenance filter system**
- ▶ **Connection to central system**

DIRECT PATH MEASUREMENT

For constant and precise processing:

- ▶ **Distance-coded incremental linear path measurement systems, sealing air-protected in all linear axes**
- ▶ **Rotary encoder in the rotary axes**

PROBE SYSTEMS fig. 4

- ▶ **Workpiece measuring (infrared probe)**
- ▶ **Tool measuring and wear control**

AUTOMATION

- ▶ **Automatic slide doors**
Opening of front doors at program end, by M function, or by pressing the open button.
- ▶ **Handling systems**
Clamping systems and pallet changer



CHIP TROLLEY fig 5

Can be **emptied on ground-level** (0.4 m³); wheeled, with fork lift slots and coolant outlet

COOLANT PROCESSING fig 6

► External band filter system

Fully automatic separation of gray water into particles (milling dust/chips/...) and pure coolant. The full flow filter increases the durability of the coolant by exfiltrating dirt and chips and ensures machine availability.

► Oil skimmer

ADDITIONAL COOLING OPTIONS

- **External air** via a separate flexible articulate hose
- **Minimum quantity lubrication** via separate flexible articulate hoses

SUPPORT SERVICE

Hotline/remote maintenance



**BELT-DRIVEN SPINDLE
10,000 RPM**

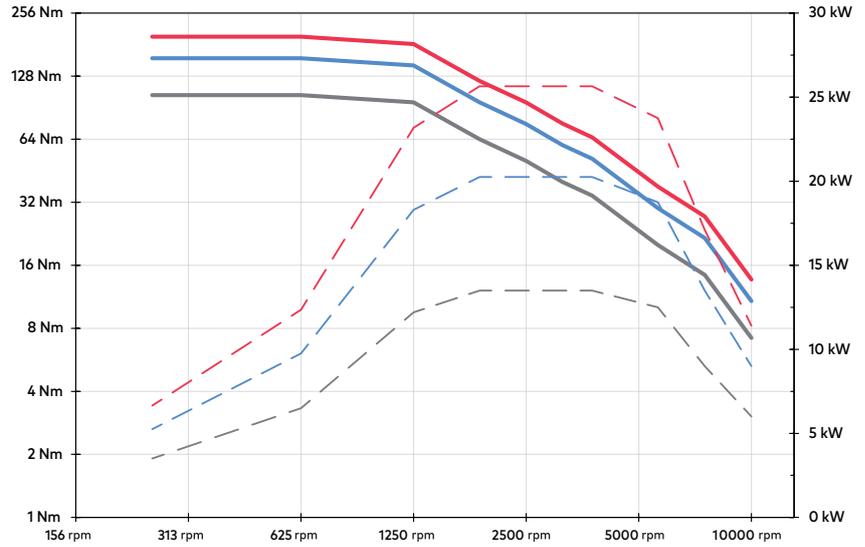
► Performance

- 12 kW (100% of duty cycle)*
- 23 kW (25% of duty cycle)*

► Torque

- 96 Nm (100% of duty cycle)*
- 182 Nm (25% of duty cycle)*

*(at 1,250 rpm)



**IN-LINE SPINDLE
14,000 RPM**

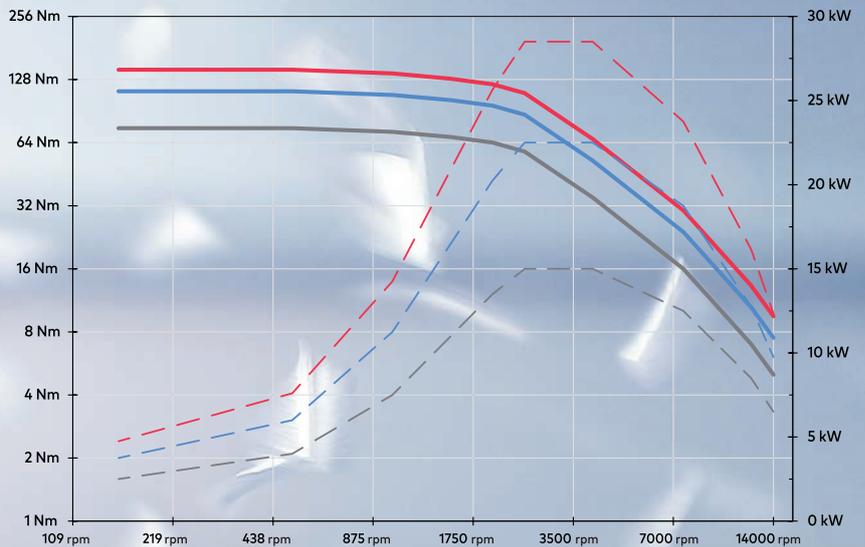
► Performance

- 13,5 kW (100% of duty cycle)*
- 25,5 kW (25% of duty cycle)*

► Torque

- 64 Nm (100% of duty cycle)*
- 122 Nm (25% of duty cycle)*

*(at 2,000 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)

IN-LINE SPINDLE 18,000 RPM

► Performance

13,5 kW (100% of duty cycle)*

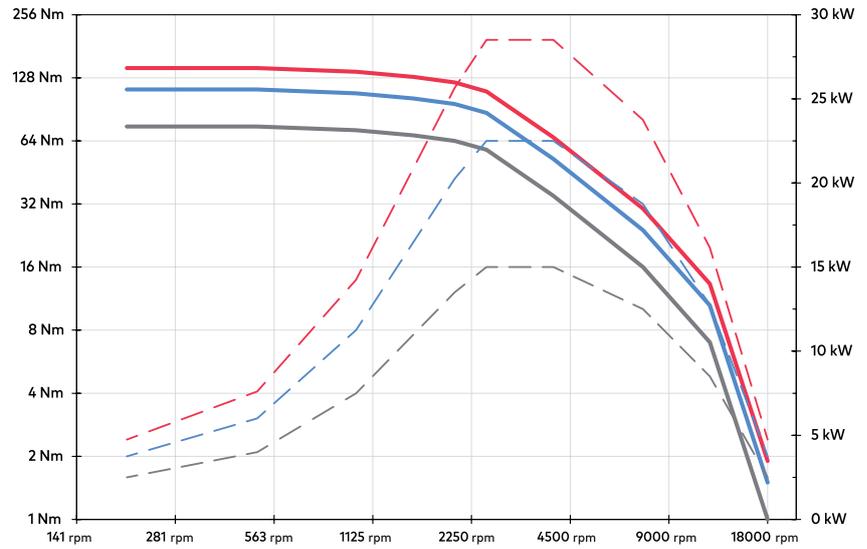
25,5 kW (25% of duty cycle)*

► Torque

64 Nm (100% of duty cycle)*

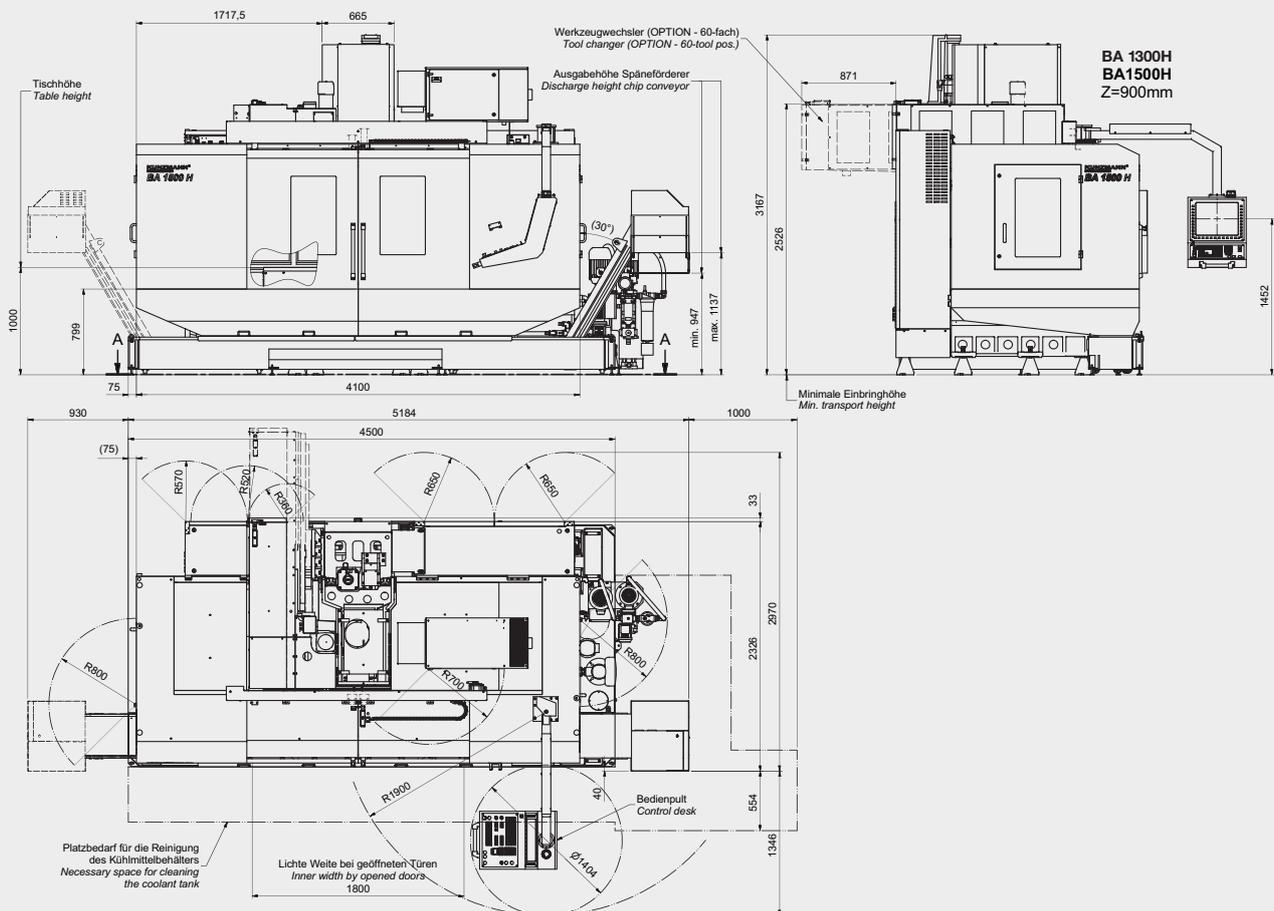
122 Nm (25% of duty cycle)*

*(at 2,000 rpm)





BA 1300 / BA 1500



STANDARD EQUIPMENT

- ▶ Vertical milling spindle SK 40
(belt-driven spindle)
- ▶ FEM-optimized cross slide table
cast iron construction
- ▶ Linear roller guideways
- ▶ Full protection cabin
- ▶ Pneumatic adjustment of counterbalance
- ▶ Automatic central lubrication
- ▶ Cleaning of tool taper via spindle air
- ▶ Spindle cooling
- ▶ External cooling
- ▶ AFR Automatic Feed Reduction
- ▶ Clamping table
- ▶ Tool changer with 38 positions
- ▶ Slat band chip conveyor
- ▶ Coolant system
- ▶ Chip rinsing gun
- ▶ Pivotable and height-adjustable
control desk

OPTIONS

- ▶ Tool taper HSK 63-A
- ▶ Tool changer with 60 positions
- ▶ In-line spindle
- ▶ Internal cooling system 25/40 bar
- ▶ Suction system
- ▶ Paper band filter system
- ▶ Probe systems
- ▶ Linear path measurement systems
- ▶ Dividing unit



Visit our website

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Working range	Longitudinal, X axis	1100 / 1300 / 1500 mm
	Cross, Y axis	750 mm
	Vertical, Z axis	650 / 900 mm
Main spindle drive	Belt-driven spindle	
	* at 1,250 rpm	Performance at 100% of duty cycle* 12 kW
	** at 2,000 rpm	Performance at 25% of duty cycle* 23 kW
	In-line spindle	
	Performance at 100% of duty cycle**	13.5 kW
	Performance at 25% of duty cycle**	25.5 kW
Spindle speed	Belt-driven spindle	10,000 rpm
	In-line spindle	14,000 rpm
	In-line spindle	18,000 rpm
Feed	X and Y axis	30 m/min
	Z axis	45 m/min
Tool taper	Belt-driven spindle 10,000	SK 40
	In-line spindle 14,000	SK 40 / HSK 63-A
	In-line spindle 18,000	HSK 63-A
Tool changer	Positions	38- / 60 positions
	Tool change time	5 sec.
	Chip-to-chip time	10 sec.
Clamping table	BA 1100 / BA 1100 H	1350 x 700 mm
	BA 1300 / BA 1500	1750 x 700 mm
Operating voltage	Voltage/frequency	400 V / 50 Hz
Controls	HEIDENHAIN	TNC 620
	HEIDENHAIN	TNC 640
	SIEMENS	840D sl
Power consumption	Depending on equipment	≥ 35 kVA
Machine weight	BA 1100 / 1100 H	approx. 8,900 / 9,000 kg
	BA 1300 / BA 1500	approx. 9,500 kg

- ▶ Manufacturer of universal milling machines and vertical machining centers
- ▶ Competent technological support
- ▶ Customer-specific application technology
- ▶ Individual programming trainings
- ▶ Prompt and convenient support service

Our strong partner

