VIBROCUT

VibroCut *ultrasonic*

Improves your manufacturing processes and increases the efficiency of your production!

Ultrasonic assistance with VibroCut *ultrasonic*

Product - VibroCut *ultrasonic*

Ultrasonic technology for machining:

- Tool holder with integrated piezo actuators for ultrasonic generation
- Contactless energy transfer
- Ultrasonic generator with control cabinet
- Assistance system and communication interfaces
- Products for different machine types

Unique position:

- Unique performance and precision
- Highly dynamic and robust control of frequency and power thanks to integrated sensor
- Optimum design for power ultrasound
- Vibration decoupling from the tool spindle

➢ Flexible retrofitting - for new and existing machines

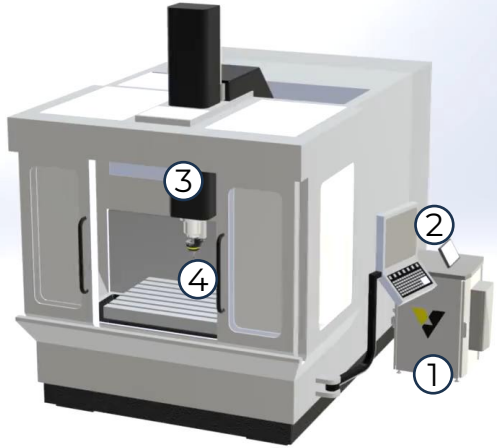
Ultrasonic tool holder
for drilling and grinding

Ultrasonic assistance with VibroCut *ultrasonic*

Structure of the ultrasound system (retrofit)

- **VibroCut *ultrasonic*** - Machine equipment
  - Cabinet with ultrasonic technology
  - Control unit with assistance software
  - Control interface to the machine tool
- **VibroCut *ultrasonic*** - Stator / torque assistance
  - For contactless energy and signal transmission to the ultrasonic tool holder
  - Mounting on spindle nose
- **VibroCut *ultrasonic*** - Ultrasonic tool holder
  - Integrated piezo technology for ultrasonic excitation of the tool
  - Integrated sensor for highly dynamic control
  - Various types and performance classes for all applications (drilling, milling, grinding, etc.)

➢ Complete system as interchangeable equipment incl. CE-certificate



1. Switch cabinet incl. ultrasonic generator
2. Display and control unit
3. Stator for power supply
4. Ultrasonic tool holder

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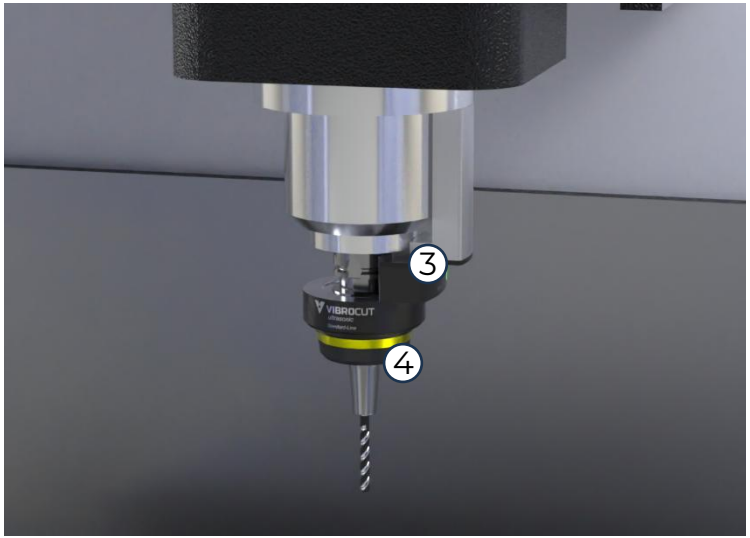

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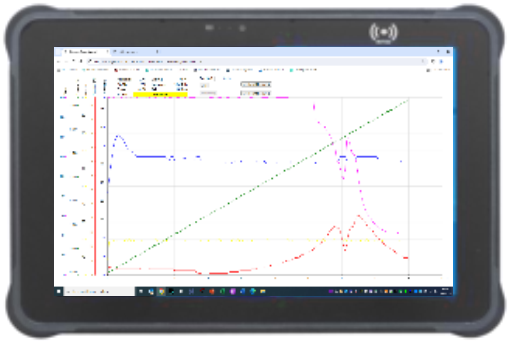
Ultrasonic assistance with VibroCut *ultrasonic*

VibroCut *ultrasonic* - Machine equipment

- **Ultrasonic cabinet**
  - For retrofitting as a side solution (dimensions 600x600x900 mm)[3]
  - Full integration possible with new machines
  - Includes ultrasonic generator incl. safety components and control unit
  - Connections and control interface to the machine tool
- ***Control interface***
  - Flexible connection and control-independent machine connection
  - Operation of the ultrasonic system via NC-program, M-commands and parameters
  - Preset ON / OFF and amplitude
  - Exchange of information on status
  - Extension of the machine routines for tool change etc.

Cabinet with ultrasonic technology



Control unit with assistance software

Ultrasonic assistance with VibroCut *ultrasonic*

VibroCut *ultrasonic* - Machine equipment

- ***Control unit***
  - As an industrial tablet with magnetic holder
  - For retrofit solution Installation next to the HMI of the machine tool
  - For assistance software for visualizing, setting up and calibrating the ultrasound system
  - Full integration in machine control possible for new machines
- **Assistance software**
  - Range of functions depending on operator level (operator, technologist, manufacturer)
  - Visualization for the machine operator (ultrasonic data, status, etc.)
  - Ultrasonic data (values and graphs) suitable for monitoring the machining process
  - Functions for self-calibration and set-up when changing the tool type

Cabinet with ultrasonic technology

Regular operation

Control unit with assistance software

Ultrasonic assistance with VibroCut *ultrasonic*

VibroCut *ultrasonic* - Stator

- **Structure and function**
  - Stator for contactless energy and signal transmission to the rotating ultrasonic tool holder
  - Reliable transmission via 0.2 mm air gap
  - Status display via LED

- **Variants**
  - Two different versions depending on performance class and machine tool
  - Machining centers
    - Automatic tool change
    - Fixed circular segment installed on spindle nose
  - Deep hole drilling machines
    - Manual tool change
    - Integration and mounted on the ultrasonic tool holder

Stator for machining centers

Stator on tool spindle for machining centers

Stator mounted on the ultrasonic tool holder For deep hole drilling machines

Ultrasonic assistance with VibroCut *ultrasonic*

VibroCut *ultrasonic* - Ultrasonic tool holder

- **Structure and function**
  - Integrated piezo technology for ultrasonic excitation of the tool
  - Integrated sensor for highly dynamic control
  - Contactless energy and signal transmission
  - Choice of different sizes, spindle and tool interfaces

Product line	Power range	Tool change
High Performance-Line	max. 1,000 W	manually
Performance-Line	max. 500 W	automatically
Standard-Line	max. 250 W	automatically
Precision-Line	max. 100 W	automatically

Ultrasonic assistance with VibroCut *ultrasonic*

Ultrasonic tool holder for different applications

Grinding

Drilling

Deep hole drilling

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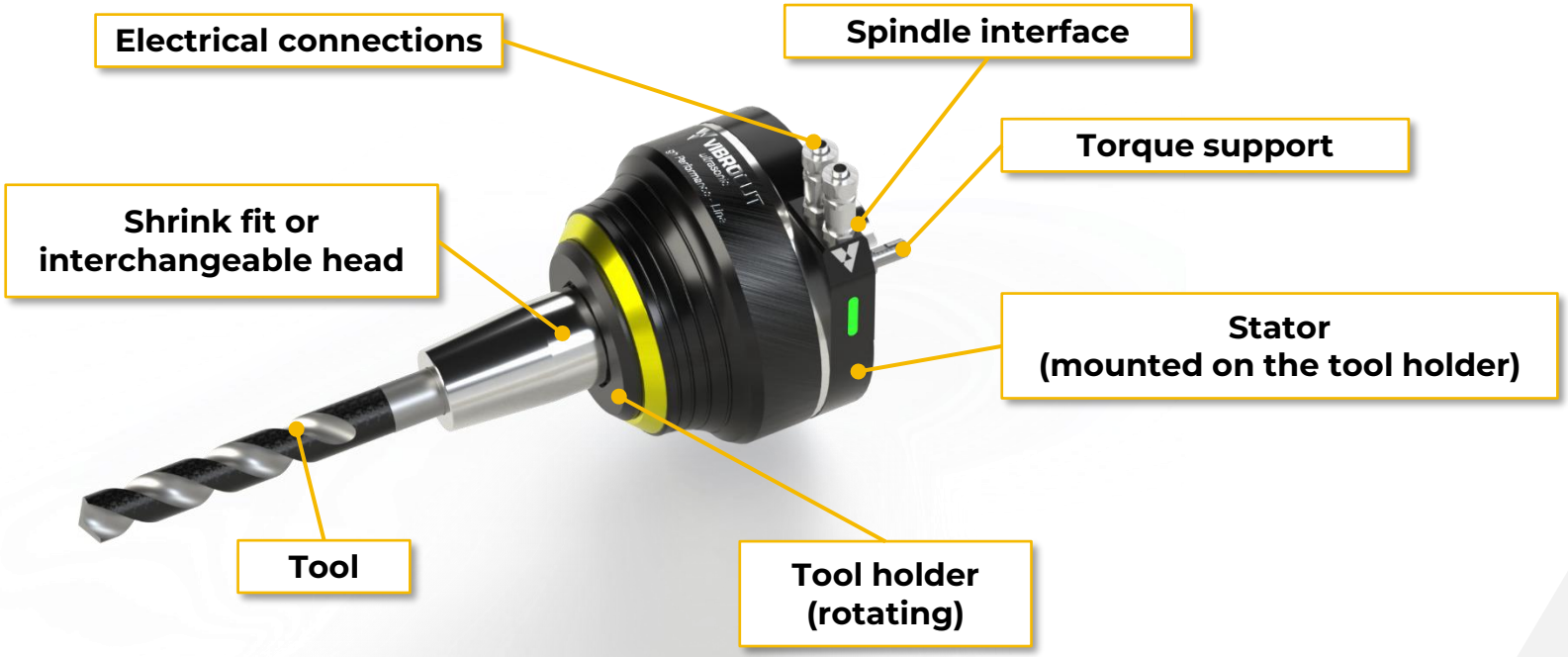
Product structure - *High Performance-Line*



➢ ***High Performance-Line for deep hole drilling machines***

Ultrasonic assistance with VibroCut *ultrasonic*

Product structure – Tool holders for machining centres

➢ ***Performance-, Standard- and Precision-Line for machining centres***

Ultrasonic assistance with VibroCut *ultrasonic*

Structure of the ultrasonic system on the spindle

Structure on spindle

Spindle with stator

Stator single

Single tool holder

Ultrasonic assistance with VibroCut *ultrasonic*

HIGH PERFORMANCE-LINE
for the largest tools and highest amplitudes

Basic properties	
Performance	max. 1,000 W
Frequencies	20,000 ... 24,000 Hz (16,000...50,000 Hz on request)
Amplitude	max. 80 µm (depending on the tool)
Tool interface	Shrink fit chuck / interchangeable head system (tool diameter according to customer requirements)
Tool change	manually
Energy transfer	Contactless + stator fully integrated
Internal coolant supply	max. 80 bar

Specific properties (data without cutting tool)

Spindle interface*	SK40 / BT40 / HSK63	SK50 / BT50 / HSK100
max. speed [min]$^{-1}$	8,000 min^{-1}	7,000 min^{-1}
max. diameter [mm]	164	199
Length [mm] (face contact to chuck)	≈ 200 mm (depending on the tool diameter)	

*Special variants on request

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PERFORMANCE-LINE
for large tools and high amplitudes

Basic properties

Performance	max. 500 W
Frequencies	20,000 ... 24,000 Hz (16,000...50,000 Hz on request)
Amplitude	max. 60 µm (depending on the tool)
Tool interface	Shrink fit chuck (tool diameter according to customer requirements)
Tool change	automatically
Energy transfer	Contactless + fixed stator
Internal coolant supply	max. 80 bar

Specific properties (data without cutting tool)

Spindle interface*	SK40 / BT40 / HSK63	SK50 / BT50 / HSK100
max. speed [min]$^{-1}$	12,000 min^{-1}	10,000 min^{-1}
max. diameter [mm]	160	195
Length [mm] (face contact to chuck)	≈ 180 mm (depending on the tool diameter)	

*Special variants on request

Ultrasonic assistance with VibroCut *ultrasonic*

Standard LINE
for flexible use

Basic properties

Performance	max. 250 W
Frequencies	20,000 ... 24,000 Hz (16,000...50,000 Hz on request)
Amplitude	max. 30 µm (depending on the tool)
Tool interface	Shrink fit chuck (tool diameter according to customer requirements)
Tool change	automatically
Energy transfer	Contactless + fixed stator
Internal coolant supply	max. 80 bar

Specific properties (data without cutting tool)

Spindle interface*	SK30 / BT30 / HSK50	SK40 / BT40 / HSK63	SK50 / BT50 / HSK100
max. speed [min]$^{-1}$	18,000 min^{-1}	16,000 min^{-1}	12,000 min^{-1}
max. diameter [mm]	110	125	160
Length [mm] (face contact to chuck)	≈ 170 mm (depending on the tool diameter)		

*Special variants on request

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Precision-LINE
for filigree tools and high speeds

Basic properties

Performance	max. 100 W
Frequencies	20,000 ... 24,000 Hz (16,000...50,000 Hz on request)
Amplitude	max. 15 µm (depending on the tool)
Tool interface	Shrink fit chuck / collet chuck (tool diameter according to customer requirements)
Tool change	automatically
Energy transfer	Contactless + fixed stator
Internal coolant supply	max. 80 bar

Specific properties (data without cutting tool)

Spindle interface*	HSK40E	SK30 / BT30	HSK50	SK40 / BT40 / HSK63	SK50 / BT50 / HSK100
max. speed [min]$^{-1}$	30,000 min^{-1}	20,000 min^{-1}	24,000 min^{-1}	20,000 min^{-1}	16,000 min^{-1}
max. diameter [mm]	62	75	75	85	125
Length [mm] (face contact to chuck)	≈ 120 mm (depending on tool interface)				

*Special variants on request

VibroCut – Hybdrid machining

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"VibroCut combines technique and technology for hybrid machining"