



**WITH YOU
SUCCESS TOGETHER**



ULTRASONIC MACHINING MODULE



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**ISO 9001
ISO 14001**



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ULTRASONIC MACHINING MODULE



ULTRASONIC MACHINING MODULE

Advanced material machining and smart manufacturing are foreseen by many major industries and as well as the future trend of CNC machining technology. Advanced materials are light weighted, hard, tough and capable of operating at a higher temperature. Precision tooling is being used by the industries involved in advanced materials, including semiconductor, optoelectronics, aerospace, medical device, energy equipment, smart electric vehicle, electronic mobile, and precision machinery. Now, the major industries are facing the innovation of transformation of advanced material which will be the great change and opportunities for more precision and excellent quality production.



QMP-23U

The CNC machining technology is transforming from the traditional metal cutting to new smart CNC machining, which combines ultrasonic vibration machining and other new types of machining methods to overcome the latest composite and various brittle materials being used on the market nowadays.

FEELER is an innovative and visionary company that focuses on the development, advanced machining technology, turnkey solutions, and teamwork. Our mission is to provide the best quality production and the most valuable customer service. Choose us to build a stronger business partnership.

ULTRASONIC MACHINING MODULE

Ultrasonic Machining Technology

Increased Productivity

The ULTRASONIC technology from FEELER enables the economical machining of complex workpiece geometries in demanding advanced materials such as ceramics, glass, corundum, tungsten carbide or even composite materials.

Based on the advanced development of the ultrasonic technology according to the requirement of the market, FEELER ultrasonic machine can provide high efficiency and high-quality machining of complex materials such as precision ceramics, quartz glass, alumina, tungsten steel, and super alloys or even composite materials.

The kinematic overlapping of the tool rotation with an additional oscillation effects a reduction of the process forces by up to 40% in comparison to conventional machining. Depending on the work-piece requirements, this allows higher feed rate, provides longer tool life and significantly surface finishing of up to $Ra < 0.1 \mu m$.

Advanced Materials

TUNGSTEN CARBIDE

Characterised by its high strength, toughness and hardness.

CERAMICS

High elastic modulus and hardness, high melting points, low thermal expansion, and good chemical resistance.

GLASS

Transparency, heat resistance, pressure and breakage resistance and chemical resistance.

INCONEL

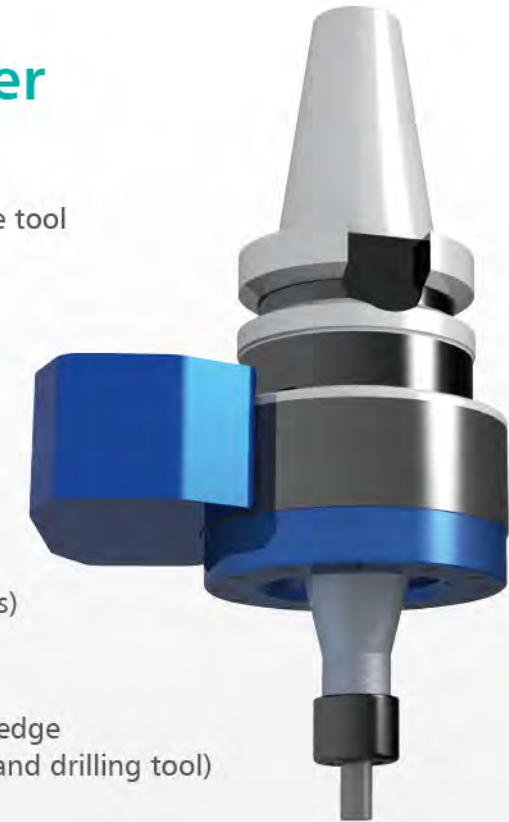
High resistance to corrosion, pressure and oxidation.

FIBERGLASS

High strength, high elasticity, light weight.

Ultrasonic Toolholder

- **Plug & Play Transmitter**
Compatible for variable CNC machine tool
- **Non-contact Ultrasonic**
Optimised inductive transmission
- **Reinforced Actuator**
To achieve high stiffness
- **Ultrasonic vibration amplitude**
0 - 15 μm (Depending on tool settings)
- **Tools**
With undefined and defined cutting edge
(Diamond grinding rod, milling tool and drilling tool)



Plug & Play Design



Design for Advanced Materials



Milling



Grinding



Drilling



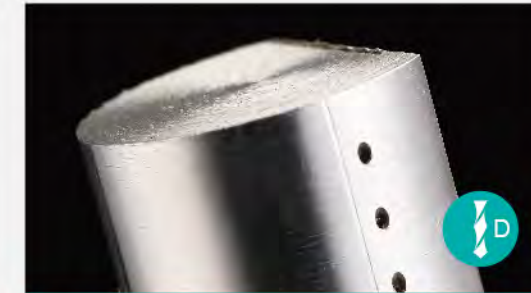
TUNGSTEN STEEL

- Without polishing, near mirror finish surface ($Ra < 0.1 \mu m$)
- Processing efficiency increases 4 times, compared to EDM
- Same processing method, efficiency increases 1.6 times
- Reducing the processing procedures
- Longer tool life by 4 times



INCONEL

- Efficiency enhanced by 30% compared to non-ultrasonic
- Prolongs tool life



AISI 304

- Processing efficiency increases 3 times
- Significant quality improvement: reducing entry distortions decreasing hole roughness



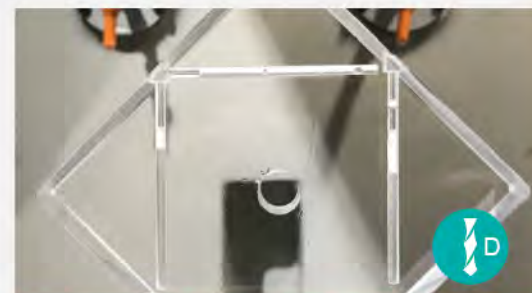
ZIRCONIUM DIOXIDE

- Better quality, compared to non-ultrasonic
- Processing time reduced by half
- Longer tool life by 3 times



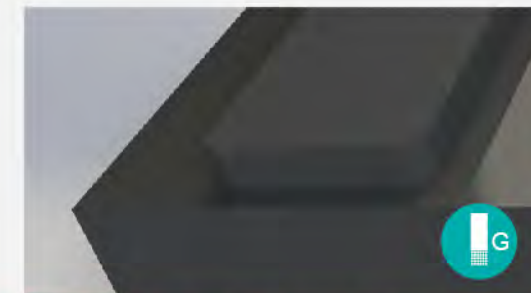
SAPPHIRE

- Processing efficiency increases 4 times, compared to non-ultrasonic
- Effectively reduce the workpiece chipping and surface micro-cracks



OPTICAL GLASS

- Better quality, compared to non-ultrasonic
- Efficiency enhanced by 800% compared to non-ultrasonic



SILICON CARBIDE

- Break the limitation of non-ultrasonic machining, increased the removal rate up to 5 times
- Better quality, reducing surface roughness by 30%



HONEYCOMB STRUCTURE

- Not only meeting the customer angular machining qualities, but increases the roughing efficiency by 4 times
- At the same quality standard, the finishing efficiency can be increased by 2 times

* Actual results depending on user machining parameters.

ULTRASONIC MACHINING MODULE

BT-30

Balance Quality Grade G2.5
High Precision runout <5 μ m

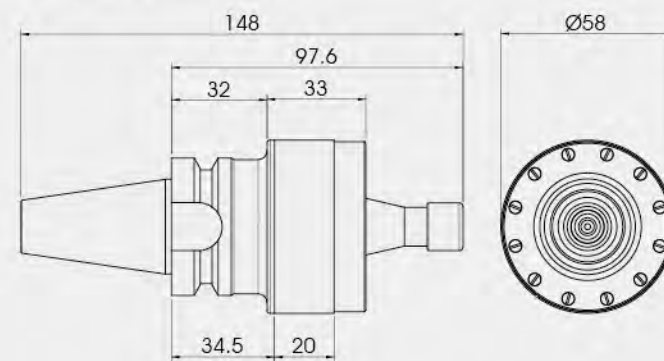
Specification

Model	BT-30
Runout(4D)	<5 μ m
Operating Freq	20 kHz ~ 32 kHz(*52kHz)
Max. Spindle Speed	30,000rpm
Collet Types	SK 6/10 H6
Weight	0.9 kg
Taper	BT30 / BBT30
ATC	Yes
CTS	≤ 70 bar



External Dimensions

Unit : mm



BT-40

Balance Quality Grade G2.5
High Precision runout <5 μ m

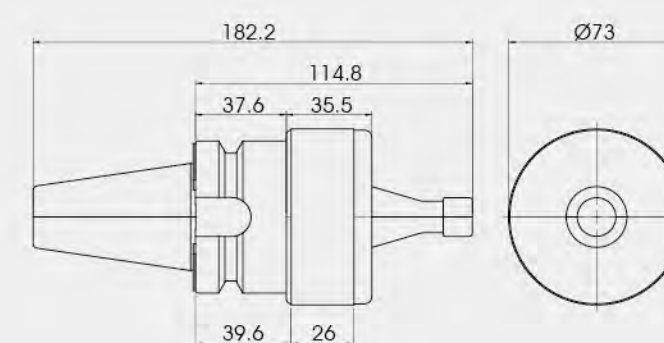
Specification

Model	BT-40
Runout(4D)	<5 μ m
Operating Freq	20 kHz ~ 32 kHz(*52kHz)
Max. Spindle Speed	24,000rpm
Collet Types	SK 6/10 H6
Weight	2.0 kg
Taper	BT40 / BBT40
ATC	Yes
CTS	≤ 70 bar



External Dimensions

Unit : mm



HSK-E40

Balance Quality Grade G2.5
High Precision runout <5 μ m

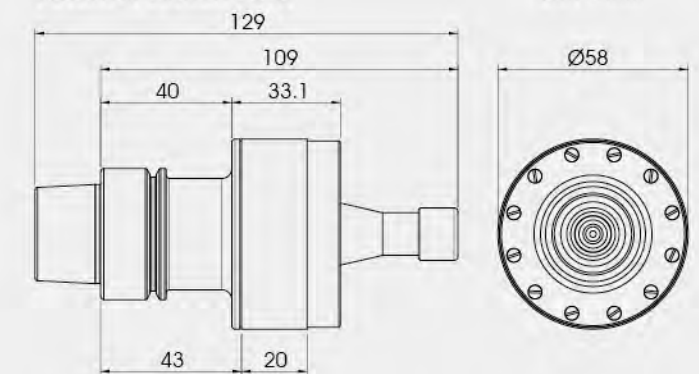
Specification

Model	HSK-E40
Runout(4D)	<5 μ m
Operating Freq	20 kHz ~ 32 kHz(*52kHz)
Max. Spindle Speed	30,000rpm
Collet Types	SK 6/10 H6
Weight	0.8 kg
Taper	HSK E40
ATC	Yes
CTS	≤ 70 bar



External Dimensions

Unit : mm



HSK-A63

Balance Quality Grade G2.5
High Precision runout <5 μ m

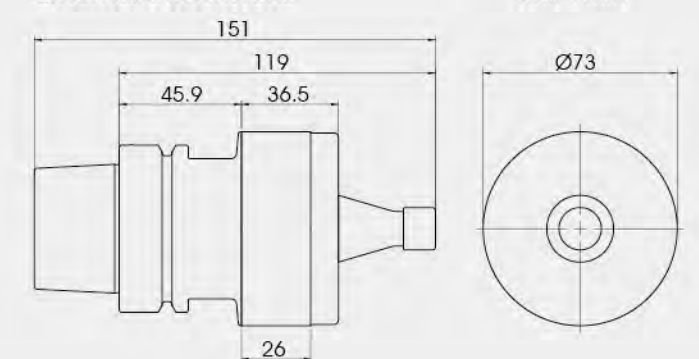
Specification

Model	HSK-A63
Runout(4D)	<5 μ m
Operating Freq	20 kHz ~ 32 kHz(*52kHz)
Max. Spindle Speed	24,000rpm
Collet Types	SK 6/10 H6
Weight	2.0 kg
Taper	HSK A63
ATC	Yes
CTS	≤ 70 bar



External Dimensions

Unit : mm



ULTRASONIC MACHINING MODULE

HSK-E32

Balance Quality Grade G2.5
High Precision runout <5μm

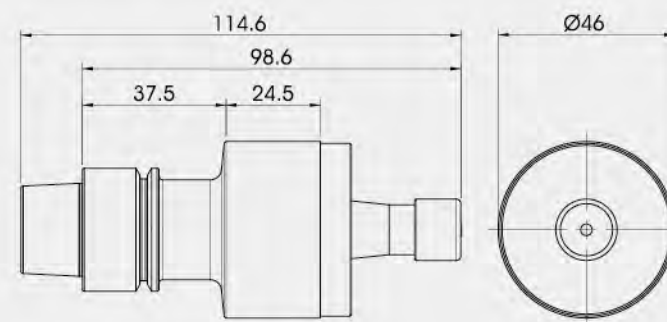
Specification

Model	HSK-E32
Runout(4D)	<5 μm
Operating Freq	20 kHz ~ 32 kHz(*52kHz)
Max. Spindle Speed	38,000rpm
Collet Types	SK 6/10 H6
Weight	0.5 kg
Taper	HSK E32
ATC	Yes
CTS	≤70 bar



External Dimensions

Unit : mm



Specification

Model	BT-30	BT-40	HSK-E32	HSK-E40	HSK-A63
Runout(4D)	<5 μm	<5 μm	<5 μm	<5 μm	<5 μm
Operating Freq	20 kHz ~ 32 kHz (*52kHz)	20 kHz ~ 32 kHz (*52kHz)	20 kHz ~ 32 kHz (*52kHz)	20 kHz ~ 32 kHz (*52kHz)	20 kHz ~ 32 kHz (*52kHz)
Max. Spindle Speed	30,000rpm	24,000rpm	38,000rpm	30,000rpm	24,000rpm
Collet Types	SK 6/10 H6	SK 6/10 H6	SK 6/10 H6	SK 6/10 H6	SK 6/10 H6
Weight	0.9 kg	2.0 kg	0.5 kg	0.8 kg	2.0 kg
Taper	BT30/ BBT30	BT40/ BBT40	HSK E32	HSK E40	HSK A63
ATC	Yes	Yes	Yes	Yes	Yes
CTS	≤70 bar	≤70 bar	≤70 bar	≤70 bar	≤70 bar

UD2

Ultrasonic Driver Modul



- **Ultrasonic Driver**
Enables Inductive Transmission



- **Control Panel**
Allows Remote Control of the Driver



- **Transmitter**
Size Depends on Toolholder Spec



I:A
Power:V
Freq:kHz
Transparent
Parameter
Information



Adjustable
Power Level



Automatic
Freq-Lock



Tool-Adaptive
Scanning



Mutiple
Control Mode



One Driver for
all Toolholders

Maximum Power	60W
Frequency Range	14 kHz ~ 52 kHz
Operation Temperature	-20°C to 50°C
Operation Humidity	5%RH-95%RH(NO coden)
Transportation / Storage Temp	-25°C to 60°C
Transportation / Storage Humi	5%RH-95%RH(NO coden)
Power Supply	AC 110V-220V Vrms±10% 50/60 Hz, 1 φ

Driver UD2	Size (mm) - H162 x W215 x D370 • 1.
Size & Weight	Weight (kg) ~4.2
Control Panle	Size (mm) - H90 x W151 x D51 • 2.
Size & Weight	Weight (g) ~261

• 1.Without mounting plates(mm) : H162 x W215 x D280

• 2.With signal cable & connector(mm): H90 x W151 x D51