

VIFU 2000

Value Innovative Pre-clinical HIFU System

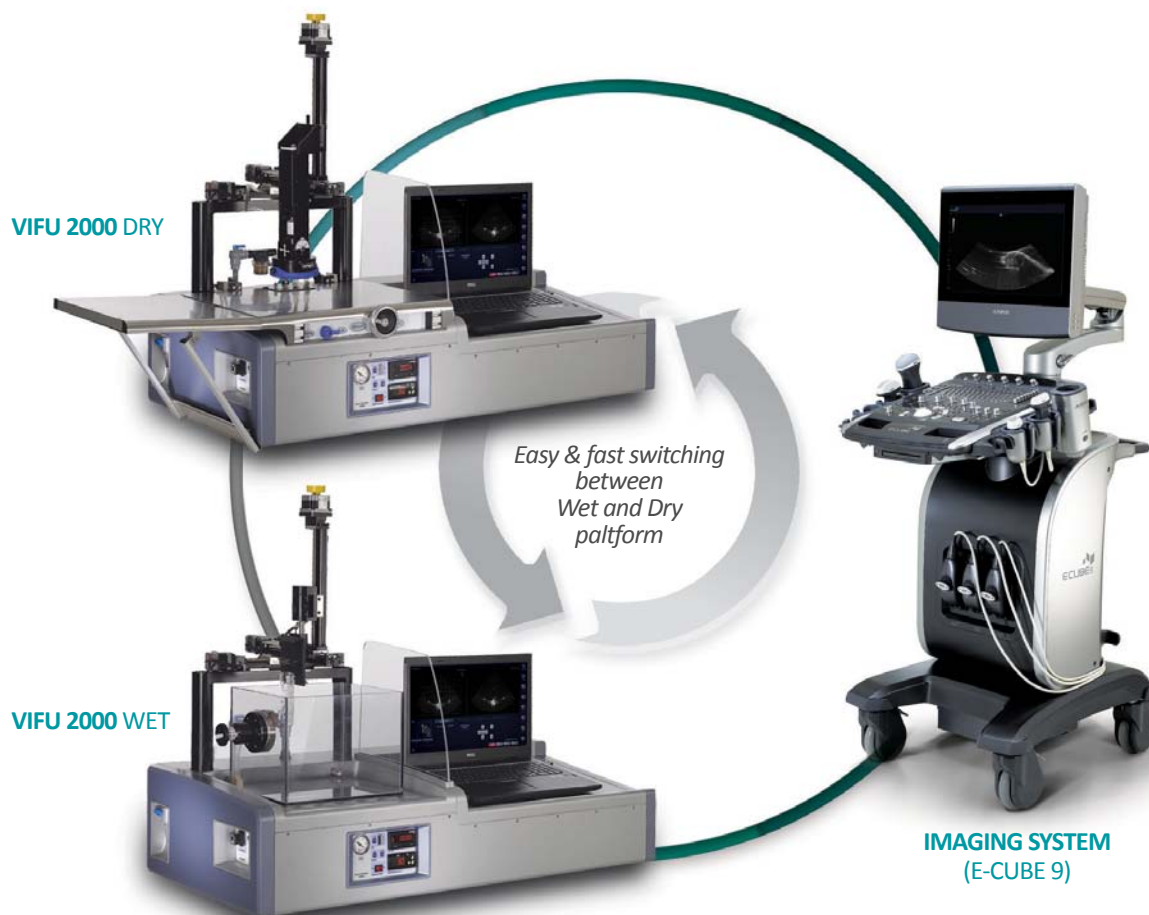
Fit for Your Lab with Great Efficiency

ALPINION's pre-clinical HIFU (high-intensity focused ultrasound) system, VIFU 2000 is uniquely designed for investigating a wide range of HIFU applications in small animals. Embedded ALPINION's proprietary HIFU technology and imaging technologies, the VIFU 2000 enables users to research ultrasound mediated drug delivery study, ablation for solid tumors, mechanical and cavitation effect in ex-vivo / in-vivo study.

Optimally designed for research laboratories, the VIFU 2000 is a compact and integrated system to offer efficient space management, providing accurate treatment results and improving research productivity.

Key Advantages

- Ultrasound guided non-invasive procedure
- Real-time monitoring
- Precise targeting for accurate treatment (converged by ALPINION's proprietary HIFU and imaging transducer technologies)
- Wet or Dry platform to accommodate various applications (easy and fast switching between Wet and Dry platform, depending on types of study)
- Turnkey bench-top system ideally designed for laboratory

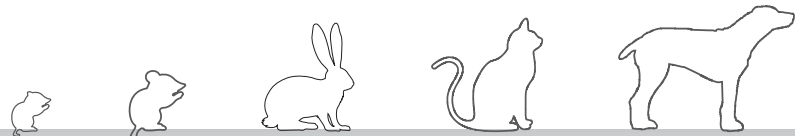


Applications & Research Fields

Combining the integrated modules of HIFU treatment with the superior image performance of ALPINION's ultrasound system (E-CUBE9), the VIFU 2000 empowers users to lead structured research planning, monitoring, treating and reporting efficiently in a wide range of pre-clinical applications.

Applications		
Solid tumor ablation	In-vivo / Ex-vivo study	Enhanced drug delivery study
Cavitation effect study		Opening the blood brain barrier (BBB)
Histotripsy	Animal treatment	

Target Uses



VIFU 2000 WET Size : Up to 6.3" x 2.8" (Length x Height, tail excluded)

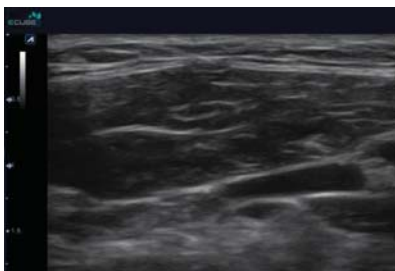
VIFU 2000 DRY Size : Up to 25" x 7" x 9" (Length x Height x Width, tail excluded) / Weight : Up to 50 lbs

Key End Users

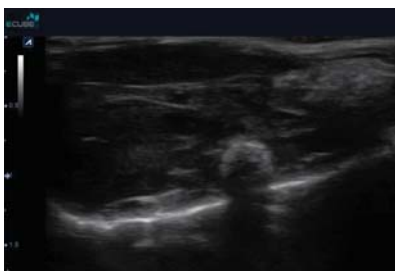
- University laboratory
- Government laboratory
- Research institutes / hospitals
- Pharmaceutical companies
- Cancer research laboratory
- Bio-medical companies

Clinical Images

Pre-Treatment

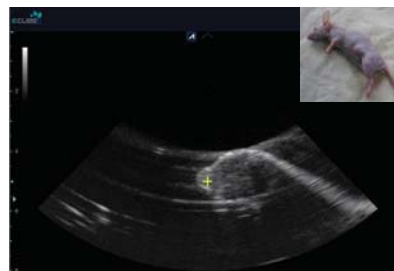


Pre-Scan : US image with linear array transducer, L8-17, mouse liver

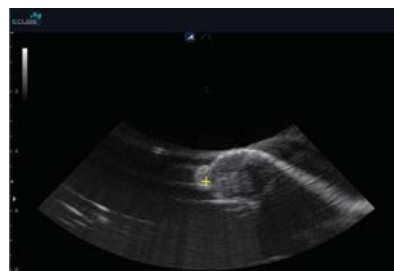


Pre-Scan : US image with linear array transducer, L8-17, nude mouse abdominal tumor

On-Treatment

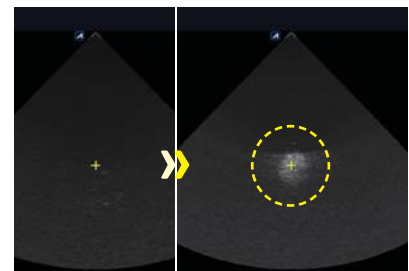


Planning : US image with phased array transducer, S12-4, human squamous cell carcinoma xenograft tumor model

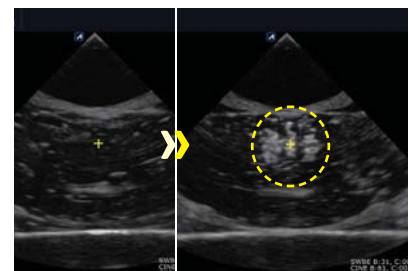


Real-Time Treatment : 5mm x 5mm tumor ablation

After-Treatment



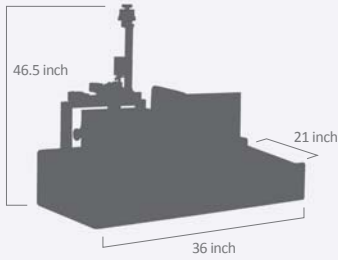
Pre & Post Treatment : single point ablation in BSA-Phantom



Pre & Post Treatment : three point ablation in BSA-Phantom

Key Elements

VIFU 2000 consists of VIFU 2000 main body, imaging system and integrated VIFU software package. The main body includes precision motion control system, water preparation system, HIFU transducer, dedicated signal generator, and amplifier. VIFU software is designed to be user-friendly with functional graphic features to streamline the operation steps.



Easy user interface

1 New Study	2 Scan	3 Treatment Direction	4 Target
5 Critical Structure	6 Treatment Plan	7 Treatment Simulation	8 HIFU Treatment

- Precision motion control system
- Automatic target alignment
- Flexible treatment plan



Treatment table (VIFU 2000 DRY)

Animal holder (3 types)

Water preparation system (Degassing/Heating)

Features

HIFU Module

- Dedicated ultrasound-guided HIFU system for animal study
- Non-invasive approach
- Integrated modules for pre-clinical study
(degassing, RF generator, water treatment, interface module, positioning system are all inside the VIFU 2000 main body)
- A turnkey bench-top system for optimal space management
- Real-time US-imaging during HIFU treatment with automatic target alignment
- Intuitive user interface and workflow to increase research productivity and efficiency
- Optimal preset for treatment (easy to operate HIFU treatment)
- Water preparation system, including degassing and temperature control capability
- Custom software for treatment plan and study report
- Flexible RF driving system to deliver various treatment protocols
- Modular fixture to customize experimental set-up
- Motorized positioning system for precise targeting

Imaging Module

- High performance imaging transducers for pre-scan and treatment monitoring
- Advanced imaging platform to maintain uniform image quality
- L8-17 (Linear array, 8~17MHz, Pre-scan purpose)
- S12-4 (Phased array, 12~4MHz, Treatment monitoring purpose)
- Automatic interleaving function control by VIFU 2000 SW

General Specifications

HIFU MODULE	Electrical requirement	120-220 VAC, 1500W peak
	Dimensions	46.5" x 36" x 21" (Length x Height x Depth)
	Weight	130 lbs (with empty water tank)
	Transducer	Single element spherical-focused transducer, 1MHz or 1.5MHz (Customizable)
	3D positioning system	- 3-axis target position control (X, Y, Z axis) - Precision : 0.01mm - Travel speed : 12.5 mm/second - Traverse distance capability: 8" x 6" x 8" (X, Y, Z)
	Water treatment	- System is preset to maintain 36°C with 1°C resolution (WET type only) - Degassing level at 4ppm or less
	RF driving system	- Capable CW or PW mode (CW : max. 400W / PW : max. 600W) - Full control of ultrasound parameter - Duty cycle : 0.005% ~ 100% - PRF : 1Hz ~ 1KHz - Adjustable treatment parameters
IMAGING MODULE	Pre-scan imaging transducer	Linear array, 8~17MHz or 3-12 MHz
	Imaging transducer	Phased array, 4 ~ 12 MHz (C/F : 7 MHz)
WET TYPE	Tank capacity	3.6 Gallons
	Hybrid cone	Allows greater access to target
DRY TYPE	Additional axis control	Manual control of rotation and tilt angle is available
	Attachable treatment table	- 32" x 13.5", Capable of handling animals up to 50 lbs - VIFU transducer membrane control system included
	Dry HIFU transducer	Interchangeable HIFU transducer assembly (user can purchase multiple transducer assembly at different frequency)



ALPINION MEDICAL SYSTEMS

ALPINION MEDICAL SYSTEMS was established in 2007 as a true value innovator in the medical imaging industry. Based on its proprietary core acoustic technologies, ALPINION sets up value innovative diagnostic imaging portfolio (E-CUBE series) and therapeutic ultrasound portfolio (VIFU series). From acoustic engineering to diagnostic and therapeutic ultrasound, ALPINION exerts every effort to deliver the most reliable, uniform and fundamentally excellent medical imaging performance to customers.

ALPINION's value innovative HIFU portfolio encompasses the clinical HIFU system for human cancer treatment (VIFU 5000 to be released in 2014) and pre-clinical HIFU system for animal research (VIFU 2000, WET / DRY type).

ALPINION's sole shareholder, ILJIN was established in 1967 and is a global manufacturer and supplier with a turnover of USD 2.5 billion (FY 2012) and 5,300 employees globally. ILJIN holds 14 affiliates and has business fields of display, smartphone touch screens and heavy electrical equipment, industrial diamonds, steel pipes and cables, and medical device.

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