

4D Multi-Row HIFU Workstation - Official Clinical Overview & Technical Datasheet

CLINICAL ARCHITECTURE & DESIGN

The 4D Multi-Row HIFU Workstation represents a paradigm shift in non-invasive tissue lifting and body contouring. Engineered with a proprietary multi-row transducer array, this system transcends traditional single-point High-Intensity Focused Ultrasound (HIFU) by delivering continuous, volumetric thermal coagulation zones. The architecture facilitates a 4D treatment matrix, incorporating depth, width, time, and temperature as variables to achieve superior clinical outcomes with enhanced patient comfort. The workstation integrates a high-precision mechanical scanning arm and a color Doppler ultrasound module for real-time visualization of the superficial musculoaponeurotic system (SMAS), ensuring precise energy deposition at the optimal tissue plane.



KEY INDICATIONS & CAPABILITIES

The 4D Multi-Row HIFU Workstation is indicated for dermatological and aesthetic procedures requiring tissue lifting, tightening, and volumetric reduction. Primary applications include the treatment of facial and submental laxity, brow ptosis, and décolletage rejuvenation. The multi-row architecture allows for the creation of continuous thermal lesion lines, drastically reducing treatment time while increasing the surface area of collagen denaturation and subsequent neocollagenesis. The system features a dynamic cooling mechanism that actively cools the epidermis during energy delivery, protecting the superficial layers while allowing for higher energy fluences to be safely applied to the deeper SMAS layer. This capability is pivotal for treating a broader range of skin types and achieving a more pronounced lifting effect compared to single-line predecessors.

COMPLIANCE & STANDARDS

This workstation complies with the stringent requirements of international medical device directives. It is certified to IEC 60601-1 (Medical Electrical Equipment - General Requirements for Basic Safety and Essential Performance) and IEC 60601-2-62 (Particular requirements for the basic safety and essential performance of high intensity therapeutic ultrasound (HITU) equipment). The device has successfully undergone rigorous electromagnetic compatibility (EMC) testing as per IEC 60601-1-2. The system is manufactured in an ISO 13485:2016 certified facility, ensuring the highest standards of quality management, risk assessment, and traceability throughout the production lifecycle. The FDA has cleared the device for dermatological use, and it holds a CE mark for distribution within the European Economic Area.

TECHNICAL SPECIFICATIONS

The operational parameters are calibrated to maximize clinical efficacy while maintaining a robust safety profile. The central control unit houses a high-performance processing core that manages energy generation, transducer movement, and real-time tissue impedance feedback. The system is configured to operate within a specific frequency range to ensure optimal focal

depth and thermal effect. The handpiece is designed for ergonomic efficiency, featuring a lightweight composite chassis and an intuitive trigger mechanism. The integrated color Doppler probe provides high-resolution imaging to verify the correct anatomical layer before energy delivery, a critical feature for patient safety and outcome predictability.

Parameter	Specification
Laser Type / Wavelength	High-Intensity Focused Ultrasound (HIFU) / 4.0 MHz / 7.0 MHz / 10.0 MHz
Focal Depth (Adjustable)	1.5 mm / 3.0 mm / 4.5 mm / 6.0 mm (SMAS Layer)
Spot Size (Focal Zone)	0.8 mm x 2.5 mm (per transducer element)
Pulse Energy	Up to 1.5 J per pulse (adjustable)
Pulse Width	20 ms - 50 ms
Cooling System	TEC + Sapphire Tip + Water Circulation + Fan Assisted
Treatment Head	Multi-Row Linear Array (1.0 cm, 1.5 cm, 2.0 cm options)
Display	15.6 inch High-Resolution Color Touchscreen (1920 x 1080)
Power Supply	AC 100-240V, 50/60Hz, 300W

Dimensions (W x D x H)	420 mm x 460 mm x 980 mm
Weight (Main Unit)	Approx. 38 kg

CLINICAL PROTOCOLS

Standard clinical protocols are segmented by anatomical region and skin laxity. For facial procedures, the energy is delivered in a grid pattern, respecting the underlying bone structure and nerve pathways. The advanced 4D algorithm automatically adjusts the focal depth and power density based on the real-time tissue resistance feedback, ensuring consistent energy delivery across varying tissue densities. For body contouring applications, the linear array is used to create a sweeping thermal effect that targets adipose tissue while lifting the overlying skin. To ensure patient comfort, the pre-cooling cycle is initiated upon contact, numbing the surface and allowing for a virtually painless experience, making the 4D Multi-Row HIFU Workstation a top-tier choice for high-volume clinical settings.

