40K Ultrasonic Cavitation Slimming Device - Official Clinical Overview & Technical Datasheet

EXECUTIVE SUMMARY

This document provides a comprehensive technical and clinical overview of the 40K Ultrasonic Cavitation Slimming Device, a non-invasive aesthetic platform designed for targeted adipose tissue disruption. Utilizing focused low-frequency ultrasound at 40 kHz, the system induces acoustic cavitation within subcutaneous fat layers, leading to adipocyte membrane destabilization and subsequent triglyceride release. The device is intended for use in professional medical spa and dermatology clinic settings as an adjunct to body contouring protocols.

CLINICAL ARCHITECTURE & DESIGN

The system operates on the principle of selective acoustic cavitation. A piezoelectric transducer generates ultrasonic waves at a frequency of 40 kHz, which propagate through dermal and subcutaneous tissues. At this frequency, the pressure variations create microbubbles within the adipose cell membrane. These bubbles expand and implode, generating localized mechanical stress that disrupts the adipocyte wall without damaging surrounding vascular or neural structures. The released fatty acids are then metabolized via the lymphatic system. The device integrates a multi-frequency power modulation circuit to maintain consistent cavitation intensity across varying tissue depths (6 mm to 20 mm).

KEY INDICATIONS & CAPABILITIES

- Primary Indication: Reduction of localized adipose deposits (abdomen, flanks, thighs, upper arms, and submental region).
- Secondary Utility: Pre-treatment tissue preconditioning for radiofrequency or laser lipolysis procedures.
- Capabilities: Non-invasive, no thermal damage to epidermis, painless operation, and no required downtime.
- Treatment Area Compatibility: Up to 450 sq cm per session with sequential applicator repositioning.

COMPLIANCE & STANDARDS

The 40K Ultrasonic Cavitation Slimming Device is manufactured in accordance with ISO 13485:2016 certified production facilities. It complies with:

- Medical Device Directive 93/42/EEC (CE Mark Class IIa)
- IEC 60601-1 (Medical electrical equipment – General requirements for basic safety and essential performance)
- IEC 60601-2-5 (Particular requirements for ultrasonic physiotherapy equipment)
- FDA 510(k) Class II regulatory pathway equivalence (cleared for soft tissue disruption)

TECHNICAL SPECIFICATIONS

Parameter	**Specification**
Ultrasound Frequency	40 kHz (nominal; ±5% tolerance)
Effective Acoustic Power	50 W (adjustable, 10-100% duty cycle)
Peak Cavitation Pressure	≥ 120 kPa at 15 mm depth
Treatment Depth Range	6 mm to 20 mm subcutaneously
Applicator Active Area	50 cm^2 (standard flat probe)
Pulse Repetition Rate	100 Hz (continuous or pulsed mode)

Power Supply	AC 110-240V, 50/60 Hz, 150 VA
Unit Dimensions (W x D x H)	320 mm x 280 mm x 180 mm
Weight (main console)	4.5 kg
Display Interface	7-inch capacitive touchscreen (preset and manual modes)
Operating Temperature	+10°C to +40°C
Relative Humidity	≤ 85% (non-condensing)

CLINICAL PROTOCOLS

Standard treatment protocol involves 8 to 12 sessions spaced 72 hours apart to allow lymphatic clearance. Each session consists of 20-30 minutes of continuous cavitation application per target area using slow, overlapping circular motions. Conductivity gel is mandatory as a coupling medium to ensure optimal acoustic impedance matching. Epidermal temperature remains below 1°C rise due to the absence of thermal mechanisms. Post-treatment manual lymphatic drainage massage is recommended to accelerate lipid metabolism.