



lumiε<sup>®</sup> Plus

lumiε<sup>®</sup> Ultra

# lumix<sup>®</sup> Plus lumix<sup>®</sup> Ultra

LUMIX<sup>®</sup> Plus e LUMIX<sup>®</sup> Ultra are the latest Fisioline<sup>®</sup> innovation derived from over 30 years of scientific and technical research carried out in hospitals and universities. They represent a new horizon of laser therapy instruments for health operators and their advanced technology is extremely performing and effective in achieving therapeutic goals.

Fisioline<sup>®</sup> has been a pioneer in adopting new therapeutic technologies with lasers that utilise pulsed, superpulsed and continuous diodes and integrating them into its own exclusive design, the C.P.S.<sup>®</sup> system.

The company's commitment has allowed Fisioline<sup>®</sup> laser devices to be sold anywhere in the world over including the American market. In fact, in November 2004 the Fisioline<sup>®</sup> lasers obtained the FDA approval in the USA.



# interactive technologies

## C.P.S.<sup>®</sup> CONTINUOUS, PULSED AND SUPERPULSED LASER SYSTEM

LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra are innovative high power multi diode lasers with C.P.S.<sup>®</sup> (Continuous, Pulsed and Superpulsed) emission that performs effective photobiostimulation in **Physiotherapy, Rehabilitative Medicine, Sports Medicine and Orthopedic fields.**

The **multi wavelength** of the LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra and the high peak powers (**300-600 W**) are the essential factors for deep tissue penetration.

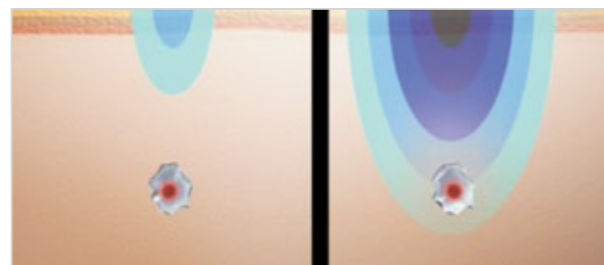
The high average powers that reach up to **35 W** allow for large volumetric treatments and the treatments are very effective and fast.

Superpulsation (from 30,000 Hz to 100,000 Hz) is the main feature in laser photobiostimulation to induce bone and cartilage growth, as attested by scientific publications carried out with Fisioline<sup>®</sup> lasers.

It is important that the laser have wavelengths that fall within the so-called "THERAPEUTIC WINDOW": LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra emit wavelengths from 650 nm to 1064 nm.

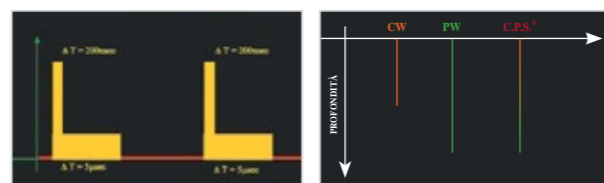
The size of the output spot has a considerable importance. This is the surface where the laser radiation is evenly distributed (power density in W/cm<sup>2</sup>). The larger the spot size, with the same power density, the higher the laser penetration in the tissues, thanks to the scattering sum.

The spot of LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra has a diameter ranging from about 2 cm to more than 6 cm, using appropriate spacers. These characteristics allow the lasers LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra to carry laser and thermal energy deep in the tissues.



Other Lasers

lumix Plus-Ultra



C.P.S.<sup>®</sup> system pulse

C.P.S.<sup>®</sup> system depth of action

### MULTI WAVELENGTH

Wavelengths selected to ensure the uniformity of energy distribution from the surface layers to the deeper tissue layers.

### INTEGRATION AND SYNCHRONISATION

The synchronisation and integration of different types of continuous, pulsed and superpulsed sources allows for direct intervention both on symptomatology and on the etiology of diseases.

### COLLIMATION: SINGLE SPOT

Optically collimated diodes mixed with optical fibres to implement homogeneous irradiation on one treatment spot.

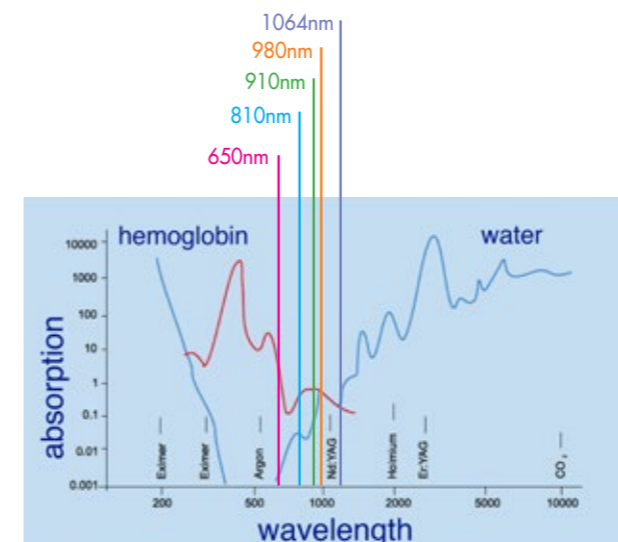
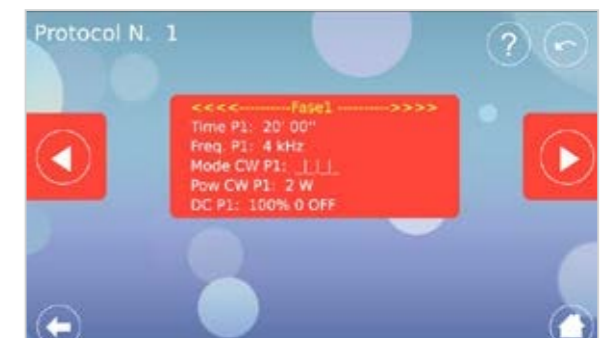
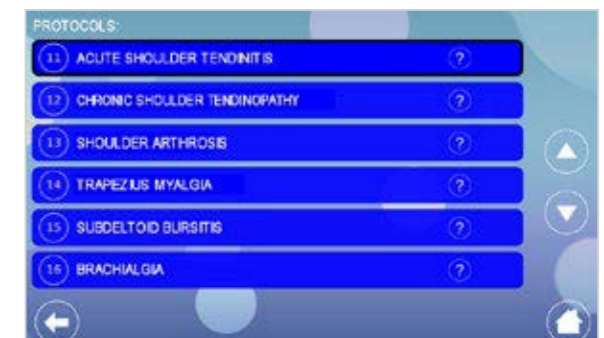
A unique feature of the LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra is the Wizard, a step-by-step digital set-up assistant guide. The Wizard guides medical personnel and physiotherapists in selecting the optimum preset therapeutic protocols thanks to its intuitive software and large touch-screen colour display.

LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra are extremely versatile and intuitive, allow easy control of energy dosage through automatic modulation of the supply parameters in relation to the zone to be treated and the chronicity of the pathology.

LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra also offer operators the possibility to create customized programs tailored to patients and suitable for the different pathologies and areas to be treated. The therapies are fast and effective.

Entirely managed by a new generation embedded system, LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra transmit laser energy through optical fibres, a system that transfers the laser light from the sources to the client's treatment area. This production method combined with an extremely versatile laser piloting device allows the LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra to mix continuous, pulsed and superpulsed source types with different wavelengths on a single spot. The high energy density, the different biostimulation of the different wavelengths and the thermal effect obtained as a consequence thereof, allow the user to work with extremely fast treatments and reducing the number of applications.

The possibility of changing the emission mode and adjusting the power and frequency make the LUMIX<sup>®</sup> Plus and LUMIX<sup>®</sup> Ultra lasers extremely versatile for laser therapy uses in the physiotherapy, rehabilitative, sport and orthopedic fields.



# 5 available wavelengths

650

## 650nm

The emitted energy is almost totally absorbed by hemoglobin, so it is particularly recommended as coagulant and antiedematous. At this wavelength, skin melanin optimally absorbs the laser energy, ensuring a high dose of energy on the surface region, encouraging the anti-edema effect. It is a great wavelength for tissue regeneration, wounds healing and fast cicatrization.

810

## 810nm

It is the wavelength with less absorption by hemoglobin and water and therefore reaches deep into tissues. It is however the closest to the maximum absorption point of melanin and therefore especially sensitive to skin color. The 810 nm wavelength increases enzyme absorption, which encourages stimulation of ATP intracellular production. The 810 nm wavelength allows for rapid activation of the oxidative process of hemoglobin, carrying the correct amount of energy to muscles and tendons and promoting tissue regeneration.

910

## 910nm

Together with 810 nm, the wavelength with the highest tissue penetrating power. The high available peak power allows for the direct treatment of symptoms. The tissue absorption of this radiation increases fuel oxygen in cells. As with the 810 nm wavelength, the ATP intracellular production is stimulated and, therefore, promotes the regenerative processes of tissues, encouraging the natural healing processes. The availability of pulsed and superpulsed sources, with high peak power and short impulses (hundreds of nanoseconds), makes the 910 nm the best efficiency in tissue depth, and reduced thermal and great analgic effects. The recovery of the cellular membrane potential interrupts the vicious circle of contracture-vasoconstriction-pain and resolves the inflammation. Experimental evidence has proven the regenerative biological stimulus with trophic-stimulating effects.

EFFECT	650nm	810nm	910nm	980nm	1064nm
ANTALGIC	•	•	•••	•••	•••
ANTI-EDEMA	••••	••••	••••	••••	••••
ANTI-INFLAMMATORY	•	••••	•••••	•••	•••
COAGULANT	••••	•	•	•	•
PHOTOMECHANICAL AND PHOTOBIOSTIMULANT			•••••		



980

## 980nm

It is the wavelength with the highest absorption by water and therefore, at equal power, it is the wavelength with higher thermal effects. The 980 nm wavelength is absorbed in large part by water in tissues and most of the energy will be converted into heat. The temperature increase at the cellular level generated by this radiation stimulates local microcirculation, bringing fuel oxygen to cells. The application of laser energy at the 980 nm wavelength interacts with the peripheral nervous system activating the Gate-Control mechanism producing a rapid analgic effect.

1064

## 1064nm

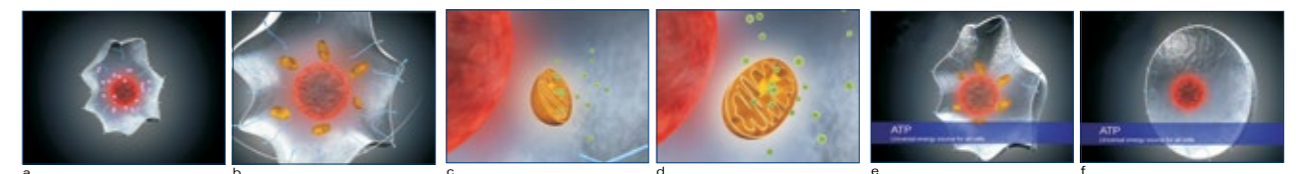
It is the wavelength which, together with 980 nm, has the highest absorption by water and therefore, at equal power, it is the wavelength with high thermal effects. It is however the wavelength farthest from the point of maximum melanin absorption and therefore less sensitive to the type of skin complexion. This wavelength has a high absorption by water of tissues and consequently a good part of the energy is converted into heat. High directionality of this wavelength reaches the affected area with the correct dose of energy. A rapid analgic effect with control of inflammatory processes and deep activation of the metabolic processes of cellular activities is obtained.

## PHOTOMECHANICAL EFFECT OF LUMIX® Plus and LUMIX® Ultra ON ATP

The LUMIX® Plus and LUMIX® Ultra increases ATP production, significantly increasing the cellular regenerative ability (Fig. a-b-c-d-e-f). Further biostimulation effect benefits are:

- **increase in protein synthesis:** new proteins replace damaged ones
- **increased immune system defence:** activation of macrophages and neutrophils, cells responsible for the body's defences
- **increase of keratinocytes and blood vessel cells:** extension of tissue healing
- **increase factors that regulate growth and cell proliferation:** this takes place in fibroblasts, cells that are the foundation of most tissues of the body
- **increase bone formation capacity:** upregulates osteoblastic activity and downregulates osteoclastic activity. In particular, it has been observed that it facilitates osseointegration of implants and speeds up tissue healing.

The photomechanical effect and Superpulsation activate after 30,000 Hz of frequency.



ATP (adenosine triphosphate) is the main carrier molecule of cellular energy. It is produced in the mitochondrial membrane.

# Information for effective, safe, and customizable therapy



## BIOSTIMULATION

Bone regeneration, tissue regeneration, bedsores, ulcers (vascular ulcers of the malleolus, diabetic ulcers, etc.), sores, lesions, perilesional points, edema, post-distorting edema, bruising, chondropathies, biointegration of implanted materials.



## PAIN THERAPY antalgic effect

Neck, shoulder, and back pain, back injury, sciatica, and general radicular syndromes of inflammatory and biomechanical origin. Articular and periarticular pain (direct and indirect antalgic effect for anti-inflammatory action). Inflammatory and degenerative neuritis and neuropathies. Muscle contractures and myofascial trigger areas.



## POST-TRAUMATIC SPORTS MEDICINE

Post-traumatic edema, traumatic origin capsular and ligamentous inflammation, sprains and muscle strain, distortions, contusions.

Based on the type of pathology being treated, on the modalities and doses, laser treatments increases the pain threshold through direct action on nociceptive nerve endings and by indirectly increasing endorphins. Moreover, the laser induces hyperemia and macrophage activation, reducing ischemia and local stasis of endogenous nociceptive tissues, exclude the onset of other possible sources of pain and inflammation. Finally, the recovery of the cellular membrane potential interrupts the vicious circle of contracture-vasoconstriction-pain and resolves the inflammation. Several sources of evidence have demonstrated the biological regenerative stimulus produced by laser irradiation. With the **LUMIX® Plus** and **LUMIX® Ultra** the operator selects the frequency, intensity and duration of frequency of the various treatment phases to obtain similar anti-inflammatory, pain-relieving and trophic-stimulating effects.



## ANTI-INFLAMMATORY

Acute tendinitis and relapse phases of chronic tendinopathy. Degenerative origin capsular and ligamentous inflammation. Acute inflammatory arthritis characterised by alternating phases of spontaneous exacerbation and remission (excellent anti-edema effect), pain and phlogosis in degenerative chronic arthropathy (arthrosis, rheumatic, etc.), bursitis, plantar fasciitis.



## LOCALIZED ANTI-EDEMA

Reduction of localized edema in the paravertebral area or in the area surrounding herniated discs.



## REHABILITATION THERAPY

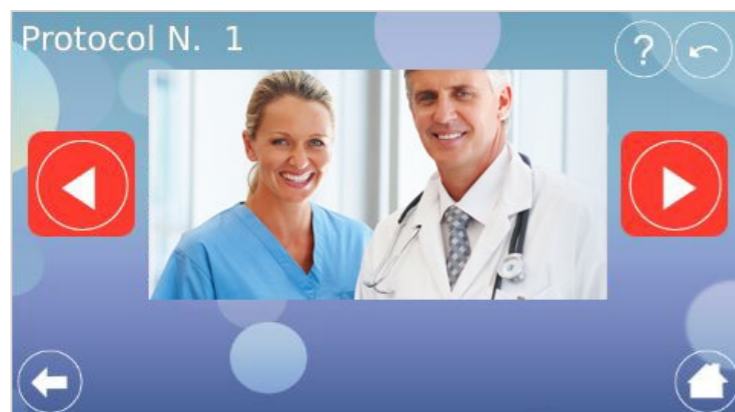
Post-surgery therapy, motor joint rehabilitation after removal of plaster casts or orthopedic surgery.

# High Fisioline technology in dynamic, powerful and versatile lasers

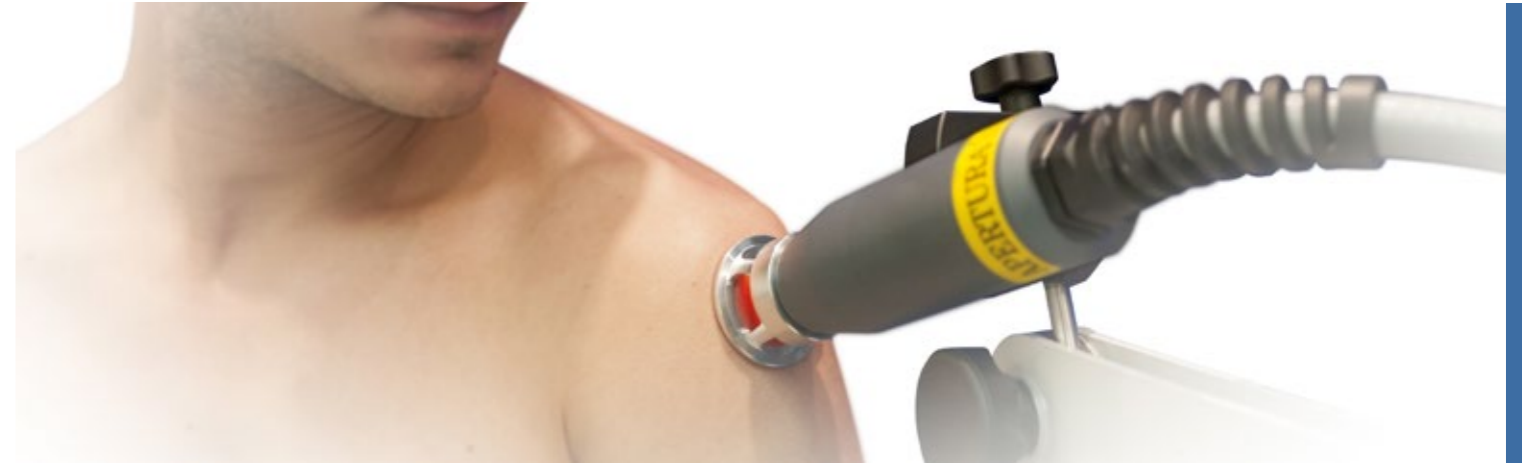


Colour touch-screen  
display with simple,  
intuitive interface

Preset therapeutic  
protocols



Audio-video  
application  
tutorials



Automatic treatment with spacers  
according to the area to treat



Spacers according to the area  
to treat (diameter 30 and 60mm)

Articulated arm  
Ergonomic handle and trolley



WiFi Bluetooth  
Pedal (Optional)



USB port for  
software update



Laser safety  
goggles

**The low level laser therapy in the management of neurological burning mouth syndrome. A pilot study.**

Umberto Romeo, DDS1, Alessandro Del Vecchio, DDS, Mauro Capocci, DDS1, Claudia Maggiore, MD, DDS2, Maurizio Ripari, MD, DDS1  
Sapienza University of Rome, Rome, Italy

**Studio preliminare, il laser nel trattamento di lesioni in pazienti affetti da epidermolisi bollosa, efficacia antalgica e biostimolante**

Ezio Sindici, Paola Mlekuz, Massimo Riso, Tiziana Ruggiero, Renato Pol  
CIR Lingotto Dental School, Dipartimento di Scienze Chirurgiche, Reparto di Chirurgia Stomatologica-HCP, Responsabile: Prof. Stefano Carossa

**High-Frequency low level diode laser irradiation promotes proliferation and migration of primary cultured human gingival epithelial cells**

Kenichiro Ejiri, Akira Aoki, Yoko Yamaguchi, Mitsuhiro Ohshima, Yuichi Izumi

**Effetto analgesico e anti-infiammatorio della terapia laser superpulsata dopo estrazione bilaterale di ottavi mandibolari inclusi.**

Ruggiero T., Pol R., Riso M., Mela L., Bianchi I. L., Mozzati M., Gassino G. F.  
University of Turin, Turin, Italy.

**Efficacy of superpulsed low level laser therapy on neurosensory recovery to the inferior alveolar nerve**

Pol R., Riso M., Ruggiero T., Dalmasso P., Mozzati M.  
University of Turin, Turin, Italy.

**Influence of Superpulsed Laser Therapy on Healing Processes Following Tooth Extraction.**

PHOTOMEDICINE AND LASER SURGERY 2011; Volume X, N. X, Pp. 1-7  
Marco Mozzati, D.D.S., Germana Martinasso, Ph.D., Nadia Cocero, D.D.S., Renato Pol, D.D.S., Marina Maggiora, Ph.D., Giuliana Muzio, Ph.D., and Rosa Angela Canuto, M.D.  
University of Turin, Turin, Italy.

**Effect of superpulsed low level laser Therapy on Temporomandibular Joint Pain,**

CLIN J PAIN 2010; Volume 00, Number 00  
Ida Martini, MD, DDS, Maria Rosaria Gatto, PhD, and Giulio Alessandri Bonetti, MD, DDS  
Bologna University, Bologna, Italy.

**Effect of Low-Level Laser Irradiation on Unresponsive Oral Lichen Planus: Early Preliminary Results in 13 Patients,**

PHOTOMEDICINE AND LASER SURGERY 2010; Volume 28, Supplement 2, Pp. S1-S6  
Adriana Cafaro, M.D., M.Sc., Gianni Albanese, D.D.S., Paolo G. Arduino, D.D.S., M.Sc., Carbone Mario, M.D., D.D.S., Gianluca Massolini, D.D.S., Marco Mozzati, M.D., D.D.S. and Roberto Broccoletti, D.D.S.  
University of Turin, Turin, Italy.

**The Low-Level Laser Therapy in the management of neurological burning mouth syndrome. A Pilot study,**

ANNALI DI STOMATOLOGIA 2010; LIX (1): 14-18  
Umberto Romeo, DDS, Alessandro Del Vecchio, D.D.S., Mauro Capocci, D.D.S., Claudia Maggiore, MD, D.D.S. and Maurizio Ripari, MD, D.D.S.  
"Sapienza" University of Rome, Rome, Italy.

**Observation of pain control in patients with bisphosphonate-induced osteonecrosis using Low Level Laser Therapy: preliminary results.**

PHOTOMEDICINE AND LASER SURGERY 2010;  
Umberto Romeo DDS, Alexandros Galanakis DDS, Christos Marias DDS, Alessandro Del Vecchio DDS, Gianluca Tenore DDS, PhD, Gaspare Palaia DDS, PhD, Paolo Vescovi DDS, PhD and Antonella Polimeni MDS  
"Sapienza" University of Rome, Rome, Italy.

**Superpulsed laser irradiation increases osteoblast activity via modulation of bone morphogenetic factors,**

LASER IN SURGERY AND MEDICINE 2009 Apr;41(4):298-304.  
Silvia Saracino, BSc, Marco Mozzati, DDS, Germana Martinasso, PhD Renato Pol, DMD, Rosa A. Canuto, MD, and Giuliana Muzio, PhD  
Department of Experimental Medicine and Oncology, Turin University, Turin, Italy.

**Protocollo di impiego laser a infrarosso superpulsato ad alta potenza (H.F.P.L.®) nel trattamento della condropatia femoro - rotulea,**

F. Verzini - Federazione Medico Sportiva - Comitato Regionale del Piemonte della FMSI - Atti del Congresso Nazionale: Torino 16 e 17 novembre 2007.

**Effect of Low-Level Laser Irradiation on Bisphosphonate-Induced Osteonecrosis of the Jaws: Preliminary Results of a Prospective Study**

PHOTOMEDICINE AND LASER SURGERY 2009; Volume 00, Number 00, Pp. 1-6  
Matteo Scoletta, D.D.S., Paolo G. Arduino, D.D.S., M.Sc., Lucia Reggio, D.D.S., Paola Dalmasso, M.Sc., and Marco Mozzati, M.D., D.D.S. - Department of Clinical Physiopathology and Public Health and Microbiology, University of Turin, Turin, Italy.

**Effect of superpulsed laser irradiation on bone formation in a human osteoblast-like cell line,**

MINERVA STOMATOLOGICA 2007; 56:: 27-30  
G. Martinasso, M. Mozzati, R. Pol, R.A. Canuto, G. Muzio  
Department of Medicine and Experimental Oncology Turin University, Turin, Italy.

**Superpulsed highpower-laser radiation induces cell proliferation and increased synthesis of the extracellular matrix components in cultured human chondrocytes**

J.A. Vega - Departamento de Ciencias Biomédicas, Sección de Anatomía y Embriología Humana, Facultad de Medicina, Universidad San Pablo - CEU, Madrid, Spain

- Models:
  - LUMIX® Plus
  - LUMIX® Ultra
- Technical classification: electromedical equipment - Class I type B
- Commercial classification: devices for laser therapy
- Medical device class: IIb (Dir. 93/42/EEC, as amended by Directive 2007/47/EC)
- Applicable regulations: General standard IEC EN 60601-1; specific standard IEC EN 60601-2-22 (IEC 62.42), collateral standard IEC EN 60601-1-6 (IEC 62-138).
- Weight: 30 Kg
- Size: 320 x 430 x 980mm
- Power supply voltage: 100-240V single phase (external power supply)
- Network frequency: 50-60Hz
- Laser source: Class 4

## AVAILABLE VERSIONS

CODE	MODEL	C.P.S. POWER		PW INFRARED	CW INFRARED			CW RED 400 mW
		AVERAGE POWER	PEAK POWER	910nm	810nm	980nm	1064nm Solid YAG	650nm
<b>LUMIX PLUS</b>								
LPLUS1001	LUMIX® Plus	10 Watt	300 Watt	•			•	•
LPLUS1002	LUMIX® Plus	10 Watt	300 Watt	•		•		•
LPLUS13	LUMIX® Plus	13 Watt	300 Watt	•			•	•
LPLUS1601	LUMIX® Plus	16 Watt	300 Watt	•	•		•	•
LPLUS1602	LUMIX® Plus	16 Watt	300 Watt	•	•	•		•
LPLUS30	LUMIX® Plus	30 Watt	300 Watt	•	•	•	•	•
<b>LUMIX ULTRA</b>								
LULTRA1901	LUMIX® Ultra	19 Watt	600 Watt	•	•		•	•
LULTRA1902	LUMIX® Ultra	19 Watt	600 Watt	•	•	•		•
LULTRA21	LUMIX® Ultra	21 Watt	600 Watt	•			•	•
LULTRA33	LUMIX® Ultra	33 Watt	600 Watt	•	•	•	•	•
LULTRA35	LUMIX® Ultra	35 Watt	600 Watt	•			•	•

- Operating mode: continuous, pulsed, superpulsed, C.P.S.®
- Frequency 1 - 100,000 Hz
- PW source pulse duration: 200ns
- Burst Mode (system for controlling the thermal effect): 10 - 100%
- RED LASER GUIDE LIGHT 650nm: actual display area of the IR beam
- Beam diameter: about 20mm; spacers according to the area to treat (diameter 30 and 60mm)
- Wide 7" TFT color touch-screen display
- Energy calculation based on the preset parameters
- Programmable electronic timer (1-99min) with digital display
- Acoustic and visual signal at end of treatment
- Lit and acoustic signals at laser source activation
- Optical sensor for laser emission test
- Interlock connection for remote control of the laser emission
- Emergency stop
- Memorised programs: large database of preset protocols for key pathologies
- User's programs
- Upgradable via USB port (USB for system/protocol/audio-video upgrades)
- CE Marking: the device complies with the requirements specified in the Directive 93/42/EEC, modified by the Directive 2007/47/EC.

UnipolSai FISIOLINE® equipment is insured for manufacturer's product liability with UNIPOLSAI.

From 2004 Fisioline®'s laser devices obtained the FDA (Food and Drug Administration) approval in the US.



MADE IN ITALY

### Fisioline® srl

Borgata Molino, 29 • 12060 VERDUNO (CN) • ITALY  
 Tel.: +39.0172.470432-0172.470433 • Fax.:+39.0172.470891  
<http://www.fisioline.com> • e-mail:fisioline@fisioline.com



As the technology is being constantly updates as well as our production systems, the technical features and sizes of the appliances described above are subject to modifications.