



**HORIZON ELECTRONICS** Ltd  
Power Systems

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# Power Supply Challenges and Solutions in Medical Applications.

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# AGENDA

- Horizon Electronics at the glance
- Key challenges facing power supply in medical applications
- Addressing the challenges with advanced power solution:
  - Aesthetic Lasers
  - CT Gantry
- Summary
- Q&A

# HORIZON AT THE GLANCE

Horizon Electronics Ltd. stands as a beacon of excellence in the world of power supply solutions. With a rich history spanning over 5 decades, and years of proven experience in developing, manufacturing and delivering power supply solutions, our commitment to innovation, precision, and quality has established us as a trusted partner in diverse sectors, ranging from industrial and medical to defense and more.



**50+ years of Experience**



**Thousands of products and systems - Delivered**



**Strong in-house R&D capabilities**



**Tested, proven & highly reliable**

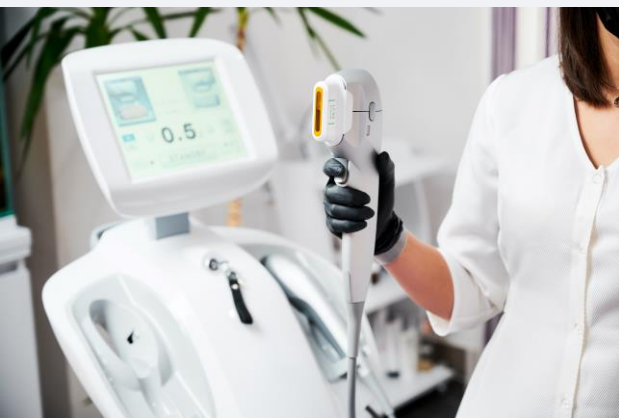


**Wide range of power – from 1W to 100kW**



**All power – Solutions under on roof**

**Power supplies are the backbone of modern healthcare facilities. They ensure the uninterrupted operation of life-saving equipment, maintain critical data systems, and support day-to-day activities in medical & healthcare environments while meeting international regulations & standards**



# KEY CHALLENGES FACING POWER SUPPLY IN MEDICAL APPLICATIONS

**Stringent Safety Requirements**- Patient safety is paramount, and power supplies must adhere to rigorous standards, ensuring leakage current control, isolation barriers, and fault protection mechanisms.

**Power Reliability** - The need for uninterrupted power supply to critical medical devices, which cannot afford even a millisecond of downtime.

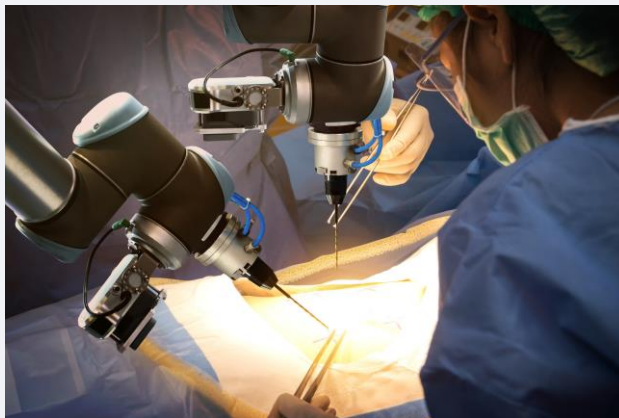
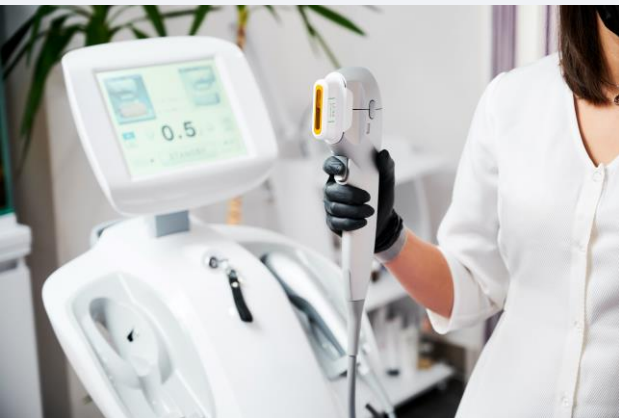
**Power Quality** - Protecting sensitive medical equipment from power surges, voltage spikes, and other quality issues that can lead to malfunctions or damage.

**Space Constraints** - Designing power supply systems that fit within the limited space available in medical settings, often requiring compact and efficient solutions.

**Scalability and Flexibility** - Adapting power systems to the evolving needs of medical facilities, including expansions, technology upgrades, and changes in healthcare practices.

**Regulatory Compliance** - Navigating the complex landscape of healthcare regulations and standards, ensuring that power supply systems meet all necessary compliance requirements.

# ADDRESSING THE CHALLENGES WITH ADVANCED POWER SOLUTION



## AESTHETIC LASERS



**Aesthetic medical laser systems are often multi-functional and can deliver a range of treatments in addition to laser, such as IPL (Intense Pulsed Light) and RF. Each of these treatments have their own specific power needs (volts and amps) .**

**There is also system house-keeping power required for cooling, control, touch panels and processing. Often, this results in several different discrete power supplies designed into these systems, adding complexity to the design while creating challenges in meeting EMI requirements due to leakage current. These systems also need to be light weight, compact and mobile for ease of movement within clinics.**

**Our power solutions enable laser manufacturers to optimize designs for high performance, reliability, and regulatory compliance.**

# WHAT WE POWER



**Pockel Cell Drive and Control**  
(Fast Reversing)

UltraVolt High Voltage Amplifier



**On Board Control**  
(Monitors, Pumps, Cooling Elements)

Artesyn Low Voltage DC-DC Converters



**Capacitor Charger for IPL and Laser**

Flexicharge / High-Power C



**System Power**  
(Control Board, Microprocessors)

CoolIX / LCM / UMP-IMP



## AESTHETIC LASERS – MAIN CHALLENGES



- **Speed of charging across wide range of charge voltages. Traditional capacitor chargers are optimized for a particular charge voltage, 800V for example in lasers. but when charging to a lower voltage, for IPL (350V), the charge rates are the same, thereby underutilizing the power capability.**
- **Systems are limited by the amount of current they can draw from a standard wall socket (15A/20A/30A etc), therefore charge speed at lower voltages under utilizes the available wall current.**
- **Multiple PSUs (capacitor charger and system power), take up space, which is problematic in mobile systems.**
- **Multiple PSUs result in multiple sources of EMI, making system compliance challenging. Multiple PSUs lead to higher leakage current.**

# FLEXICHARGE



- The Flexicharge delivers highly efficient programmable capacitor charging power over a wide range of voltages and has a built in AC-DC configurable power supply providing end users up to 800 W of low voltage power for other system needs in 5 channels.
- Constant power charging maximizes the use of available current and allows faster charging at lower voltages for IPL, enabling faster treatments. Capacitor Charger and system power in one package simplifies EMI compliance and reduces time/cost.
- Full safety certified capacitor charger and system power with  $<300\mu\text{A}$  leakage current simplifies safety and reduces time/cost. Configurability and digital communications allow system designers to easily adjust power supply parameters during system development.
- Excellent pulse to pulse repeatability
- The high-power density all-in-one design saves 30% space in the system while also simplifying integration.

## CT GANTRY

The Power requirements for a CT vary depending on the market segment the CT is planned for.

On many occasions, the patient table is manufactured by a third party and receives a single line input from the gantry. It has its own power supply which typically ranges between from 300 W and 1 kW. The PSU in the stationary Gantry ranges between 600 W and 1.5 kW, providing between 12 and 48 VDC. The power requirements of the rotating Gantry, which drives mainly the detector units and the related thermal stability elements, are by far more demanding due to the physical stress caused by high g-forces and accelerated aging during X-ray radiation. The output typically ranges between 2V to 24V with a total need of up to 3.5 kW



## CT GANTRY – MAIN CHALLENGES



**Stationary Gantry** - to ensure sufficient & reliable power for all of the current and future requirements in an efficient manner which includes powering tables, sensors, displays, switches, controllers, fans etc. and simultaneously monitoring the PSU as it is an important part of the CT system.

**Rotating Gantry** - to ensure reliable power of 3 kW or more despite the physical forces (up to 90G) and constrains in space ranging from 2 V up to 48 V and at the same time being able to monitor the PSU as important part of the CT system.

**Detector & Read-out Electronics** - Understanding which detector technology is currently used or will be used in future (EID / PCD). Power requirements can vary so ensuring the least changes and coping with the HV DC-DC in the new PCD technology.

## uMP, LCM, LE SERIES



uMP Gen II Series



LCM Series



LE Series

The intelligent MP Series of AC-DC Power supplies with microprocessor-controlled PFC front end provides:

- Modular, up to 7 slots, outputs ranging from 2-60 VDC, mixing & matching, connecting parallel or series
- Fully configurable (input & output signals, up & down sequencing)
- Intelligent fan speed control

The LCM series provides outstanding quality and high efficiency ( $\geq 90\%$ ) at a low cost:

- Single output, ranging from 12-48 VDC, with optional 5 VDC standby
- Up to 10 units in parallel, up to 4 with I-share connected
- Broad range of operating temperature without derating

The UltraVolt LE Series offers outstanding stability for precision high-voltage applications:

- Single output, positive and negative polarity models
- Up to 30 W output power
- Very low ripple (0,0025%)

# SUMMARY

- We offer a wide range of solutions for medical and healthcare applications
- We tailor power supply solutions according to our customers' specific needs
- All our solutions are tested, proven, and FDA approved
- We provide extended warranty and on-going support

**Challenge us with your power demands**

# May the power be with you!

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