

# POWER SUPPLY FOR MEDICAL APPLICATIONS

## Standard or customized development?

Standard or customized? This is a question that many developers in the medical sector ask themselves. Delta offers solutions across the entire power supply range. From standard power supply units available at short notice to completely customer-specific developments. Of course, existing power supply units can also be individually adapted or configurable variants can be used. This flyer will help you with the basic considerations when selecting a power supply, especially in a medical environment. We support your developers with the design-in and work with you to find the best solution for your application.

## The most chosen standard power supplies for medical applications

Delta's standard medical power supply portfolio primarily targets mid to high-end applications. Customers often opt for Delta due to the higher power density, low leakage current, and Class B conducted and radiated EMI interference.




	IMA Series	MEB Series	MEU Series	MEP Series	MEA Series	MEG Series
Output power	400 W~2000 W	500 W~2500 W*	600 W, 650 W	120 W, 200 W	65 W~250 W	16.5 W~3000 W
Number of output	Single output with 5 V standby	Single output with 5 V standby	Single output with 5 V standby and 12 V for fan	Single output	Single output	Up to 18 configurable
Earth and isolation	Type BF, 2 x MOPP					
Format	Enclosed	Enclosed	Open frame	Open frame	Adapter	Enclosed
Cooling	Fan	Fan	Convection	Convection	N/A	Fan
EMI	Class B					
Current sharing	Yes	Yes	Yes	-	-	Single output module supports current sharing
Proven applications	Robotic surgery systems, radiology machines, lab machines, aesthetic machines, hematology analyzers, operation tables.	Therapy machines, MRI, aesthetic machines, blood analyzers, ultrasound machines.	Dialysis machines, dentist equipment, IVD equipment, anesthesia machines, ultrasound.	Oxygen concentrators, aesthetic machines.	Handheld ultrasound machines, CPAPs, endoscopy machines, medical displays.	Laparoscopy surgical systems, microscopy / sequencers, medical laser, imaging systems, spectroscopy instruments.

\*2500 W coming soon

## For high-end medical equipment, critical requirements include low-noise variable speed fans, adjustable output voltage, active current sharing, low leakage current, and Class B conducted and radiated EMI compliance.

The IMA Series and MEB Series stand out as some of the most high-end single-output medical power supplies available in the market. With an output power capacity of 1000 W and higher, they incorporate up to two variable-speed fans that effectively manage power supply temperature without producing unbearable noise. These power supplies offer adjustable output voltage and active current sharing, providing greater flexibility for end system design and development. Their low leakage current and adherence to conducted and radiated EMI Class B standards contribute to enhanced safety and EMC at the system level. The IMA-S2000 PLUS and MEB-1K5W48V also excels with high peak power to support the start-up of electromechanical components like fans and motors.




### Medical power supplies for high-end applications

	IMA-S2000 PLUS	MEB-1K5	MEB-2K5
			
Output power	2000 W (coming soon)	1500 W	2500 W (coming soon)
Adjustable output range	±20%	±10%	-11%~+16%
Dimensions	309.6 x 127 x 40.6 mm	127 x 204 x 40.5 mm	127 x 259 x 40.6 mm
Acoustic noise level	< 39 dB(A) @ 50% load, 30 °C	30 dB(A) @ 30% load, 25°C 45 dB(A) @ 80% load, 25°C	< 45 dB(A) @ 2000W, 30°C
Leakage current (264Vac/63Hz, normal condition)	Input-earth < 300 µA Output-earth < 230 µA	Input-earth < 500 µA Output-earth < 100 µA	Input-earth < 306 µA Output-earth < 64 µA
PMbus	Yes	-	Yes
Special highlights	Remote on/off, power good, AC good, peak power 3000 W for 5 sec	Remote on/off, peak power 2200 W @ 48 V, no load power consumption 1 W	Up to 29.5 W/inch <sup>3</sup> power density, remote on/off, power good

## When it comes to small to mid-sized medical devices, the most significant considerations often revolve around compact size, noiseless convection cooling, peak power, and derating performance.

The MEU and MEP Series have been purposefully designed and engineered for small to mid-sized, typically portable medical devices, where acoustic noise levels and power density are paramount concerns. These power supplies rank among the most compact options available at their respective output levels, preserving internal system space for other functionalities. Their convection cooling design ensures a noiseless operation. Additionally, they outperform competitors with up to a 20% better derating performance, assuring reliable system operation under extreme conditions.

### Medical power supplies for small to mid-size applications

	MEU-650W	MEP-120A	MEP-200A
			
Output power	650 W	120 W	200 W
Dimensions	152.4 x 101.6 x 40 mm	76.2 x 50.8 x 31 mm	101.6 x 50.8 x 28.5 mm
Power density	17.25 W/inch <sup>3</sup>	16.67 W/inch <sup>3</sup>	22.3 W/inch <sup>3</sup>
Energy efficiency	Up to 96%	Up to 94%	Up to 95.4%
Peak power	N/A	150 W @ 15 V for 10 sec	N/A
Derating	53.3% load @ 70°C	50% load @ 70°C	50% load @ 70°C

# MEG-A Configurable Power Supplies have been designed with flexibility in mind, offering a compact size, a wide range of output selections, PMbus capability, lower leakage current, and reversible fans. These qualities make it the ideal power solution for the most advanced medical systems.

For developers working on the most advanced medical machines, the flexibility to achieve cutting-edge design is of utmost concern. That's why Delta launched MEG-A Series configurable standard power supplies.

The MEG-A series distinguishes itself as one of the most compact configurable power supplies available in the market, boasting a power density up to 2.6 times that of its configurable counterparts. This empowers system designers with the flexibility to optimize limited internal space. The series offers an adjustable output voltage range from 2V to 60V through various modules and current configurations, ensuring a wide array of options.

Recognizing the significance of communication and integration with medical IoT in advanced medical systems, MEG-A supports not only PMbus but also offers a selection of multiple communication modules. It operates efficiently over a broader temperature range when compared to alternative solutions, and its reversible fans provide diverse thermal solutions at the system level.

Furthermore, the user-friendly graphic interface allows users to adjust the output voltage of each module, monitor input voltage, fan speed, and ambient temperature.

## 4 types of cases and max. output



**MEG-700A3**  
700W  
3 slots  
88.9 x 215.9 x 41.5 mm



**MEG-1K2A4**  
1200W  
4 slots  
88.9 x 254 x 40.5 mm



**MEG-2K1A6**  
2100W  
6 slots  
127 x 254 x 40.5 mm



**MEG-3K0A9**  
3000W  
9 slots  
181 x 254 x 40.5 mm

## 3 types of output modules



Single slot module  
300W



Single slot dual-output module  
240W



Triple slot module  
1200W

## 3 types of communication modules



RS-232  
communication  
module



RS-485  
communication  
module



USB  
communication  
module

**2V~60V**

Adjustable Output Voltage

Up to **2.6X**

Power Density

Up to **93%**

Energy Efficiency

**-20~70°C**

Operable

**3000 W**

Max. Output

- Adjustable output voltage
- Monitor input voltage
- Monitor fan speed
- Monitor ambient temperature



# Sometimes the right power supply doesn't exist until you meet Delta.

Delta has been developing and engineering power supplies for the world's best-known brands for over 50 years. Customers entrust Delta with some of the most challenging power supply design missions to create their next big innovations. Here are two success stories:



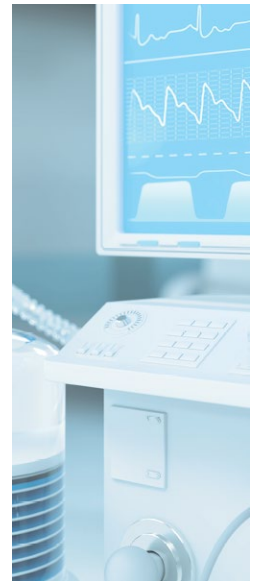
## **A 2-in-1 power supply and onboard charger with both AC and DC outputs and extremely low ripple for an ultrasound machine.**

A customer wanted to build a high-end portable ultrasound machine that generates crystal-clear, high-resolution ultrasound images. The power supply needed to provide multiple AC and DC outputs and charge batteries simultaneously. Additionally, the ripple from the power supply needed to be further reduced to achieve the desired imaging results. Delta owns several related patents and has extensive experience in reducing ripples. Our first sample met most of the customer's requirements.

**“Delta is far ahead of the other power supply vendors we work with in Ultrasound.” – Customer feedback**

## **A fanless power supply with 2 x MOPP isolation, microcontroller-controlled battery management, and durability against extreme shocks and vibrations for an artificial respiration machine.**

A customer wanted to build a portable artificial respiration machine that can withstand extreme shocks and vibrations in an ambulance. Since the machine is used in near-patient scenarios, it requires a power supply compliant with the most stringent standard – 2 x MOPP isolation. Battery backup and microcontroller-controlled management are also critical as it is a life-saving device. Delta offered a design incorporating digital interaction with analog power train control methods and an intelligent charging function to protect LiFePo4 batteries. Project management and documentation processes also adhered to the IEC 13485 and IEC 62304 certifications for software and hardware, as required.



**“Delta’s R&D did a great job by identifying issues in the customer specs and provide innovative solutions to end up with exactly what we need. Great job done!” – Customer feedback**



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With our power supplies and DC/DC converters, we offer you reliable and durable quality power supplies. In the operator area (MOOP), we have an even more extensive product range of power supplies ready to offer you future-proof products and a fast market entry. To ensure your production reliability, we offer high availability, guarantee safety stock and take care of the logistics for you. From standard products to completely customized products meeting individual requirements, we provide you with solution-oriented support.