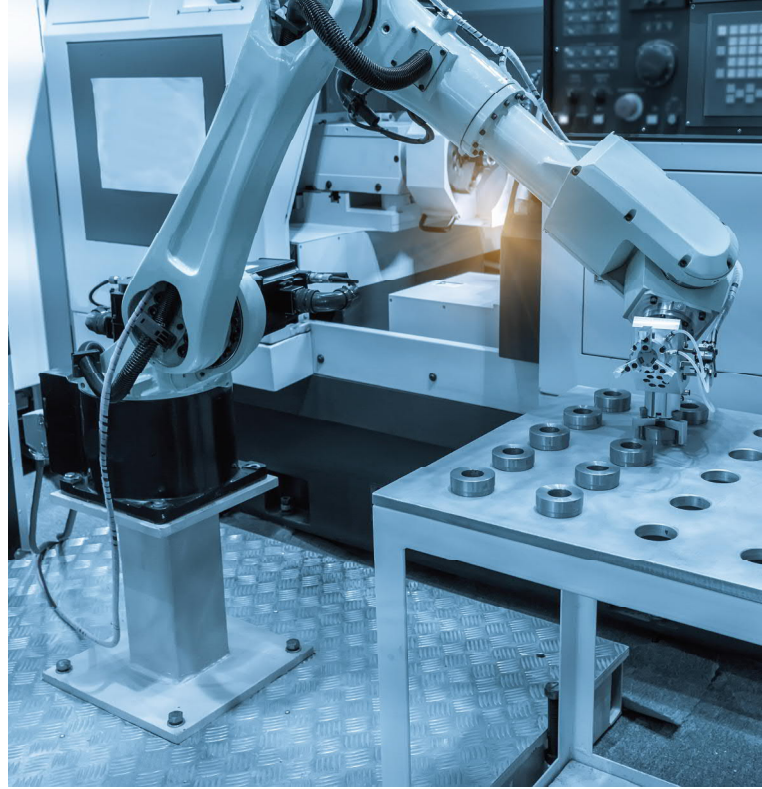


Medical Power Solution
Catalogue

Searching the **RIGHT** POWER SOLUTION Only **P-DUKE**



IEC 60950-1 | IEC 62368-1
IEC 60601-1 Edition 3.1 | IEC 60601-1-2 4th Edition



Power the World, the Innovator of Power Solutions

P-DUKE devotes a lot of efforts in nurturing research staffs. We introduce latest technology skills along with the research instrument and CAD to our factory, making our researches to reach the world-class level.

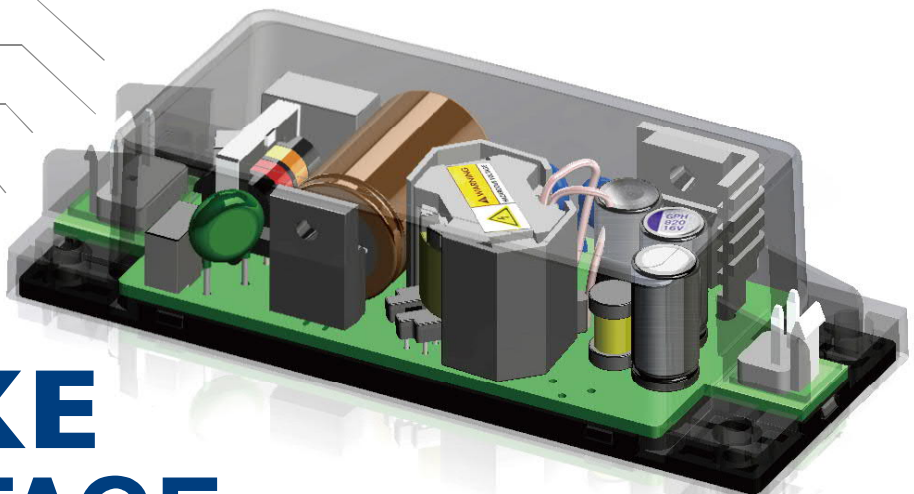
We've acquired ISO 9001 Quality Management System certification, and safety approval of UL and CE. Our products own many design and manufacturing process patents, and our medical product even won the Innovation Award of TAITRONICS in 2014 and 2015.

P-DUKE has an excellent R & D team. In addition to develop products of high power density and green concept, we also put efforts on researches and developments for multiple kinds of products in order to enhance the completeness of the product specification.

Australia: sales@heliosps.com.au - **New Zealand:** sales@heliosps.co.nz - **Asia & Middle East:** sales@heliosps.asia



- High Efficiency
- High Isolation
- Low Leakage
- Protection
- Reliable



P-DUKE ADVANTAGE



Over 25-Year Manufacturing Experience

Provide Customized Products

Excellent Service

In the medical applications, the instruments would touch human's body directly or indirectly. Therefore it requires much stricter for safety and stability on statutory specification than other products.

We provide various medical application solutions based on high-quality and innovative design. Also it's our commitment to develop precise and stable products to bring customers the safety, efficiency and quality consistency.

We have more than 25 years' experience in developing and manufacturing power supplies. For medical applications, we provide high isolation and low leakage current products and have been approved by FCC, EN60601-1, international specifications certification

Besides standard products, we can offer customized solution through excellent design ability to provide total power solution to customers.



IEC 60601-1 OVERVIEW

WHAT IS IEC 60601-1?

IEC 60601 is a series of technical standards for the safety and effectiveness of medical electrical equipment.

PRIMARY STANDARD

The primary standard of medical device design is officially called IEC 60601-1 medical electrical equipment - Part 1: General requirements for basic safety and essential performance. It is referred to as IEC 60601-1 or just “60601” simply and compliance with this standard has become a basic requirement to bring new medical devices to market in many countries.

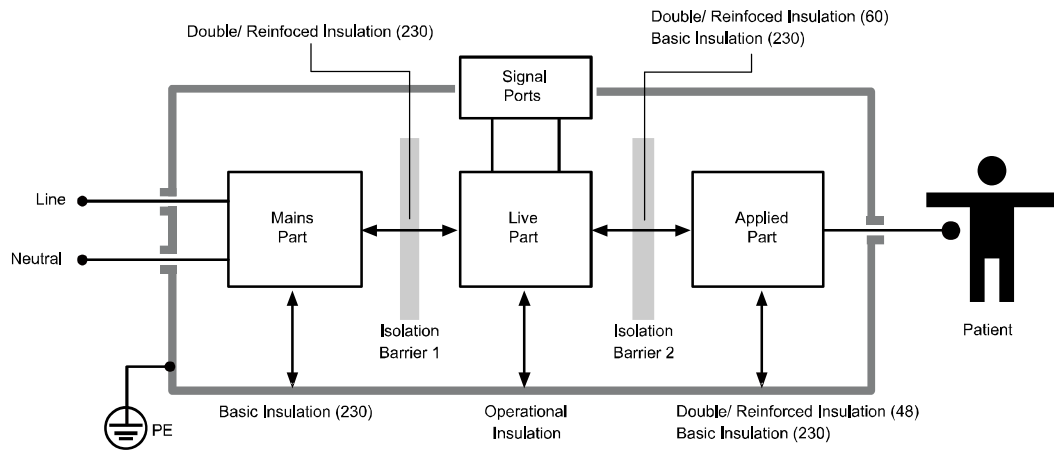
REFORMATION OF IEC 60601

The IEC60601-1 2 edition only illustrated basic safety issues to protect from any electrical, mechanical, radiation, and thermal hazards. However, it did not require devices to remain being functional and enough safe nor take the essential performance of the device into account under pass/fail result test. Therefore, the IEC60601-1 3 edition introduces specifications for essential performance that requires medical/healthcare equipment to continue functioning throughout the test process.

Because the medical and healthcare safety certification of AC/DC power supply and DC/DC converter take very important role of the medical safety regulation, the IEC60601-1 3 edition have introduced some new concept like the basic performance of equipment...etc., and it has distinguished the protection level toward devise operator (MOOP) and patient (MOPP), which includes requirements for safety distance, insulation schemes and dielectric strength.

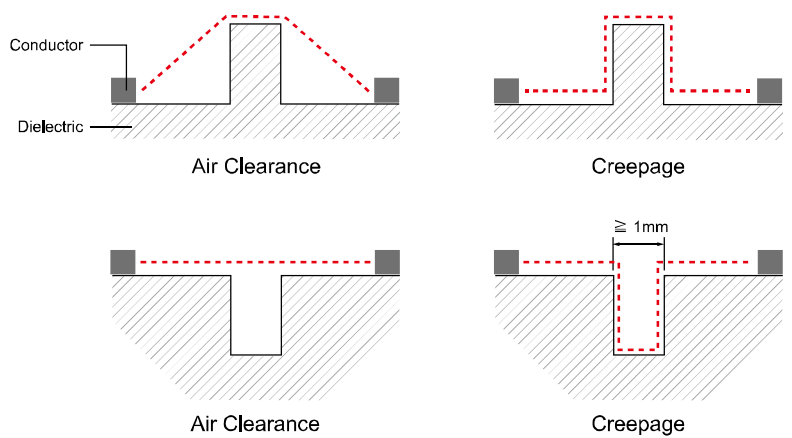
The classification defines various indicators, such as isolation, insulation, creep-age, clearance, and leakage current that are safe and allowed to be touched by devise operator or patient.

Medical Insulation System Structure



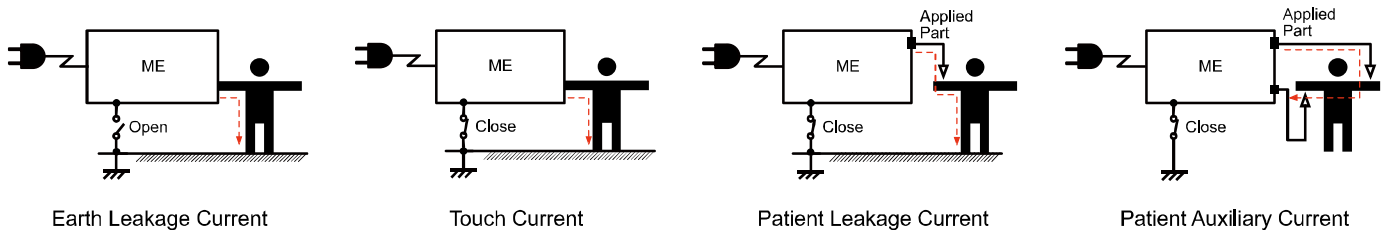
Insulation Requirements

Insulation		1 MOP Basic	2 MOP Double/ Reinforced
MOOP	Air Clearance	2.0 mm	4.0 mm
	Creepage	3.2 mm	6.4 mm
	Isolation Voltage	1500 VAC	3000 VAC
MOPP	Air Clearance	2.5 mm	5.0 mm
	Creepage	4.0 mm	8.0 mm
	Isolation Voltage	1500 VAC	4000 VAC



Leakage Current

Leakage Current		Type B		Type BF		Type CF	
		NC	SFC	NC	SFC	NC	SFC
Earth Leakage Current		5 mA	10 mA	5 mA	10 mA	5 mA	10 mA
Touch Current		100 μ A	500 μ A	100 μ A	500 μ A	100 μ A	500 μ A
Patient Leakage Current	AC	100 μ A	500 μ A	100 μ A	500 μ A	10 μ A	50 μ A
	DC	10 μ A	50 μ A	10 μ A	50 μ A	10 μ A	50 μ A
Patient Auxiliary Current	AC	100 μ A	500 μ A	100 μ A	500 μ A	10 μ A	50 μ A
	DC	10 μ A	50 μ A	10 μ A	50 μ A	10 μ A	50 μ A

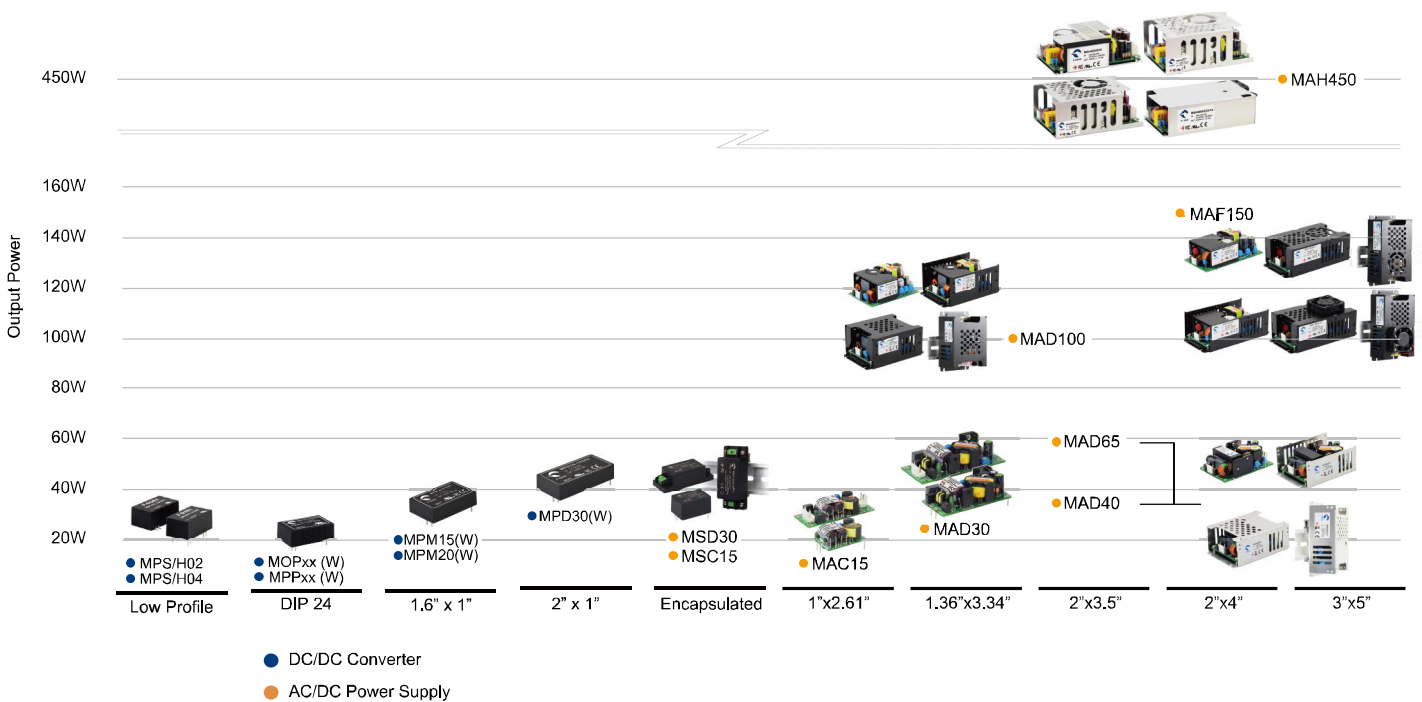




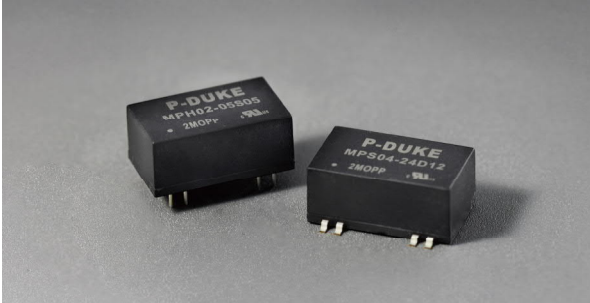
Medical Power Solutions

AC/DC Power Supplies and DC/DC Converters for Medical Application

P-DUKE provides 2-30W DC/DC and 15-450 AC/DC with many different kind of package to meet different space and installation requirements in medical applications.



Medical Product Line

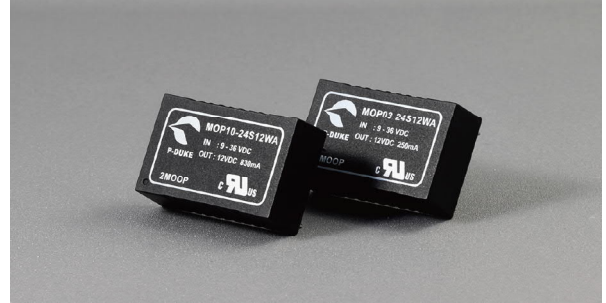


MPS / MPH series NEW

2-3.5 Watts | DC-DC

- 2:1 Input Voltage : 4.5-12, 9-18, 18-36, 36-75 VDC
- Output Voltage : 3.3, 5, 9, 12, 15, 24, ± 12 , ± 15 VDC
- Up To 5000VAC Isolation Voltage
- 2MOPP
- Low Profile
- Standard SMD Package
- Through Hole Type

*3.3 Vout only for MPS/H02



MOPxx / MOPxxW series

3-10 Watts | DC-DC

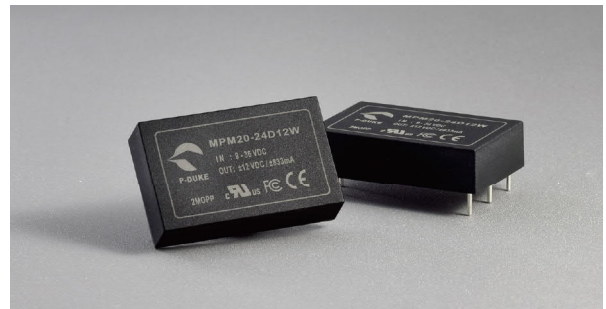
- 2:1 & 4:1 Input Voltage : 4.5-9, 9-18, 18-36, 36-75VDC
9-36, 18-75VDC
- Output Voltage : 3.3, 5, 12, 15, 24, ± 5 , ± 12 , ± 15 VDC
- Up To 3000VAC Isolation Voltage
- Built-in EN55032 EMI Class A Filter
- 2MOPP
- Standard DIP 24 Package
- Through Hole Type



MPPxx / MPPxxW series

3-10 Watts | DC-DC

- 2:1 & 4:1 Input Voltage : 4.5-9, 9-18, 18-36, 36-75VDC
9-36, 18-75VDC
- Output Voltage : 3.3, 5, 12, 15, 24, ± 5 , ± 12 , ± 15 VDC
- Up To 5000VAC Isolation Voltage
- Built-in EN55032 EMI Class A Filter
- 2MOPP
- Standard DIP 24 Package
- Through Hole Type



MPM15 / MPM15W

MPM20 / MPM20W series NEW

15-20 Watts | DC-DC

- 2:1 & 4:1 Input Voltage : 9-18, 18-36, 36-75VDC
9-36, 18-75VDC
- Output Voltage : 5, 12, 15, 24, ± 5 , ± 12 , ± 15 VDC
- Up To 5000VAC Isolation Voltage
- Built-in EN55032 EMI Class A Filter
- 2MOPP
- Standard 1.6" x 1" Package
- Through Hole Type

Medical Product Line



MPD30 / MPD30W series **NEW**

30 Watts | DC-DC

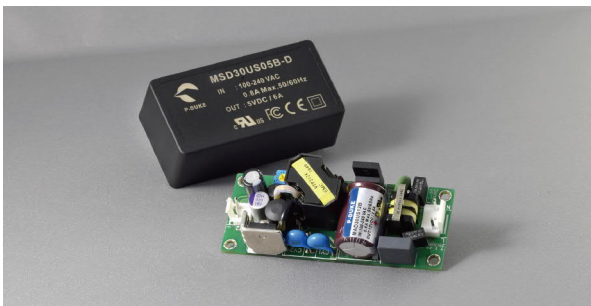
- 2:1 & 4:1 Input Voltage : 9-18, 18-36, 36-75VDC
9-36, 18-75VDC
- Output Voltage : 5, 12, 15, 24, ±5, ±12, ±15 VDC
- Up To 5000VAC Isolation Voltage
- Built-in EN55032 EMI Class A Filter
- 2MOPP
- Standard 2" x 1" Package
- Through Hole Type



MAC15 / MSC15 series

15 Watts | AC-DC

- Input Voltage : 85-264VAC, 120-370VDC
- Output Voltage : 3.3, 5, 7.5, 9, 12, 15, 18, 24, 28, 36, 48, 53 VDC
- Up To 4000VAC Isolation Voltage
- Built-in EN55032 EMI Class B Filter
- Wide Operating Ambient Temp -40°C to 85°C
- 1.00" x2.61" x0.62" Package
- Through Hole, Screw Terminal and Connector Type



MAD30 / MSD30 series

30 Watts | AC-DC

- Input Voltage : 85-264VAC, 120-370VDC
- Output Voltage : 3.3, 5, 7.5, 9, 12, 15, 18, 24, 28, 36, 48, 53 VDC
- Up To 4000VAC Isolation Voltage
- Built-in EN55032 EMI Class B Filter
- Wide Operating Ambient Temp -40°C to 85°C
- 1.36" x3.34" x0.77" Package
- Through Hole, Screw Terminal and Connector Type



MSD40 / MSD65 series **NEW**

40-65 Watts | AC-DC

- Input Voltage : 85-264VAC, 120-370VDC
- Output Voltage : 5, 7.5, 9, 12, 15, 18, 24, 28, 36, 48, 53 VDC
- Up To 4000VAC Isolation Voltage
- Built-in EN55032 EMI Class B Filter
- Wide Operating Ambient Temp -40°C to 85°C
- 2.22" x3.22" x1.20" Package
- Through Hole, Screw Terminal and Connector Type

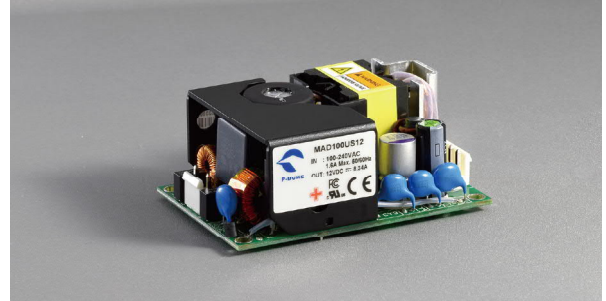
Medical Product Line



MAD40 / MAD65 series

40-65 Watts | AC-DC

- Input Voltage : 85-264VAC, 120-370VDC
- Output Voltage : 5, 7.5, 9, 12, 15, 18, 24, 28, 36, 48, 53 VDC
- Up To 4000VAC Isolation Voltage
- Built-in EN55032 EMI Class B Filter
- Single Output & Multi-Output
- Low Leakage Current Under 75 μ A
- Wide Operating Ambient Temp -40°C to 85°C
- 2.00" x 3.00" x 0.94" Package
- Open Frame, U Chassis, Enclosed, Din-rail
Screw Terminal and Connector Type



MAD100 series

100 Watts | AC-DC

- Input Voltage : 85-264VAC, 120-370VDC
- Output Voltage : 12, 15, 18, 24, 28, 36, 48 VDC
- Up To 4000VAC Isolation Voltage
- Built-in EN55032 EMI Class B Filter
- Low Leakage Current Under 75 μ A
- 2.00" x 3.00" x 1.16" Package
- Open Frame, U Chassis, Enclosed, Din-rail
Screw Terminal and Connector Type



MAF150 series

150 Watts | AC-DC

- Input Voltage : 85-264VAC, 120-370VDC
- Output Voltage : 12, 15, 18, 24, 28, 36, 48 VDC
- Up To 4000VAC Isolation Voltage
- 2.00" x 4.00" x 1.16" Package
- Open Frame, U Chassis, Enclosed, Din-rail
Screw Terminal and Connector Type



MAH450 series

450 Watts | AC-DC

- Input Voltage : 85-264VAC, 120-370VDC
- Output Voltage : 12, 15, 24, 28, 36, 48, 53 VDC
- Up To 4000VAC Isolation Voltage
- Built-in EMI Class B Filter
- Wide Operating Ambient Temp -40°C to 85°C
- 3.00" x 5.00" x 1.58" Package
- Open Frame and Enclosed Type