

Medical AC-DC Open Frame

MEP-25A15J □ / 15V 25W

MEP-25A15J □



Highlights & Features

- Safety Approvals to IEC 60601-1 3.1rd ed. & IEC 60950-1
- Compliant with IEC 60601-1-2 4th Ed. Requirements
- Low touch current (<70uA Normal & 210uA single fault)
- Over-Voltage/Load/Temperature & Short Circuit protections
- 2 x MOPP (means of patient protection)

Safety Standards



CB Certified for worldwide use

Model Number: MEP-25A15J □
Unit Weight: 70 grams (2.47 ounces)
Dimensions (W x L x H): 50.8 x 76.2 x 23.0 mm
 (2.0 x 3.0 x 0.91 inch)

General Description

The MEP-25A15JBNA provides a 15V output voltage and can operate in temperatures ranging from -10°C to +50°C, with de-rating from +50°C to +70°C. Other features include low touch current and electric shock protection complying with 2 x MOPP. The MEP series is certified according to EMC standards EN 55011 for industrial, medical equipment and EN 55032 for Industrial Technology Equipment (ITE) equipment. It is fully compliant with RoHS Directive 2011/65/EU for environmental protection. Risk management report can be provided upon request.

Model Information

Medical AC-DC Open Frame

Model Number	Input Voltage Range	Rated Output Voltage	Rated Output Current
MEP-25A15J BNA	90-264Vac	15Vdc	1.67A

Model Numbering

MEP Delta Medical open frame power supply	-	25 Output Power 25 → 25W	A Family Code	15 Output Voltage 15 for 15V	J Input Connector J: Harness JST	BNA CC code
---	---	---------------------------------------	-------------------------	---	---	-----------------------

Medical AC-DC Open Frame

MEP-25A15J □ / 15V 25W

Specifications

Input Ratings / Characteristics

Nominal Input Voltage	100-240Vac
Input Voltage Range	90-264Vac
Nominal Input Frequency	50-60Hz
Input Frequency Range	47-63Hz
Input Current (max.)	0.55A @ 115Vac, 0.35A @ 230Vac
Efficiency (typ.)	86.5% @ 230Vac, 100% load
Standby Power (max.)	0.3W @ 230Vac/50Hz
Inrush Current (max.)	30A @ 115Vac, 45A @ 230Vac
Touch Current (max.)	70uA @ 240Vac NC ¹⁾ , 210uA @ 240Vac SFC ²⁾

1) NC: normal condition

2) SFC: single fault condition

Output Ratings / Characteristics

Nominal Output Voltage	15Vdc
Total regulation	± 1.5%
Output Current	1.67A
Output Power	25W
Line Regulation (max)	±0.5%
Load Regulation (max)	±1%
*Ripple & Noise (max.)	120mV pk-pk @ Full load
Rise Time (max)	100ms @ 115Vac & 230Vac (100% load)
Start-up Time (max)	3000ms @ 115Vac , 1500ms @ 230Vac
Hold-up Time (min)	16ms @ 115Vac , 90ms @230Vac @100% load
Dynamic Response (Overshoot & Undershoot O/P Voltage)	± 3% @ 50-100% load (Slew Rate: 0.25A/μS, 50% duty cycle @ 10Hz)

*Ripple & noise is measured with an AC coupling mode, and in parallel to end terminal with 0.1μF ceramic capacitor & 47μF electrolytic capacitor. PSU need to burn in > 5 minutes when AMB ≤ 0°C

Mechanical

Dimensions(W x L x H)	50.8 x 76.2 x 23.0 mm (2.0 x 3.0 x 0.91 inch)	
Weight (typ.)	70 grams (2.47 ounces)	
Terminal	Input	JST: B2P3-VH(LF)(SN) or equivalent
	Output	JST: B4P-VH(LF)(SN) or equivalent

Medical AC-DC Open Frame

MEP-25A15J □ / 15V 25W

Environment

Surrounding Air Temperature	Operating	-10°C to +70°C
	Storage	-40°C to +85°C
Power De-rating	-10°C to +50°C 100% load 50°C to 70°C de-rate power by 2.5% / °C	
Operating Humidity	5-95% RH (Non-Condensing)	
Storage Humidity	5-95% RH (Non-Condensing)	
Operating Altitude	Up to 5,000 meters (up to 16,400 feet or 106-54kPa)	
Shock Test (Non-Operating)	50G, 11ms, 3 shocks for each direction	
Vibration (Non-Operating)	5-500Hz, 2.09Grms, 20 minute for each three axis	

Protections

Overvoltage (max)	150%, Latch Mode
Over load / Over current (max)	150%~210% of rated load current, Hiccup Mode, (Non-Latching, Auto-Recovery)
Over Temperature	Hiccup Mode, (Non-Latching, Auto-Recovery)
Short Circuit	Hiccup Mode, (Non-Latching, Auto-Recovery)
Protection Against Shock	Class I with PE* connection
Isolation Resistance	I/P-O/P · I/P-FG · O/P-FG : 100MΩ / 500VDC / 25°C / 70% RH

*PE: Protective Earth

Reliability Data

MTBF (typ.)	3 Million Hours based on Telecordia SR-332 I/P: 100Vac, O/P: 100% load, Ta: 25°C
Expected Cap Life Time	10 years (100Vac, 100% load @ 25°C)

Medical AC-DC Open Frame

MEP-25A15J □ / 15V 25W

Safety Standards / Directives

Medical Safety		IEC60601-1 3 rd and 3.1 rd edition CB report IEC60601-1 edition 3.1 rd (2012), EN60601-1 (2006) + A11 + A1 + A12, CAN/CSA-C22.2 NO. 60601-1:14, ANSI/AAMI ES60601-1:2005/(R)2012
ITE Safety		IEC60950-1 (Ed.2,2005), GB4943.1-2011, GB9254- 2008, GB17625.1-2003
CE		MDD Directive 93/42/EEC
Galvanic Isolation	Input to Output	4000 Vac
	Input to Ground	1500 Vac
	Output to Ground	500 Vac

EMC (Compliant with IEC 60601-1-2 4th Ed. Requirements)

EMC / Emissions		EN55011/EN55032, FCC Title 47:Class B
Harmonic Current Emissions	IEC61000-3-2	Complies with EN61000-3-2, Class A
Voltage Flicker	IEC61000-3-3	
Immunity to		
Electrostatic Discharge	IEC61000-4-2	Level 4 Criteria A ¹⁾ Air Discharge: 15kV Contact Discharge: 8kV
Radiated Field	IEC61000-4-3	Criteria A ¹⁾ 80MHz-2700MHz, 10V/m AM modulation 385MHz-5785MHz, 28V/m Pulse mode and other modulation
Electrical Fast Transient / Burst	IEC61000-4-4	Level 3 Criteria A ¹⁾ :2kV
Surge	IEC61000-4-5	Level 3 Criteria A ¹⁾ Common Mode ³⁾ : 2kV Differential Mode ⁴⁾ : 1kV
Conducted	IEC61000-4-6	Level 2 Criteria A ¹⁾ 150kHz-80MHz, 3Vrms, 6Vrms at ISM bands and Amateur radio bands
Power Frequency Magnetic Fields	IEC61000-4-8	Criteria A ¹⁾ Magnetic field strength 30A/m
Voltage Dips	IEC61000-4-11	Criteria A ¹⁾ 0% U _r , 0.5 cycle (10ms) , 0°/45°/90°/135°/180°/225°/270°/315°/360° Criteria B ²⁾ 0% U _r , 1 cycle (20ms), 0° Criteria A ¹⁾ 70% U _r , 25 cycle (500ms), 0° Criteria B ²⁾ 0% U _r , 250 cycle (5000ms), 0°

1) Criteria A: Normal performance within the specification limits

2) Criteria B: Output out of regulation, or shuts down during test. Automatically restore to normal operation after test.

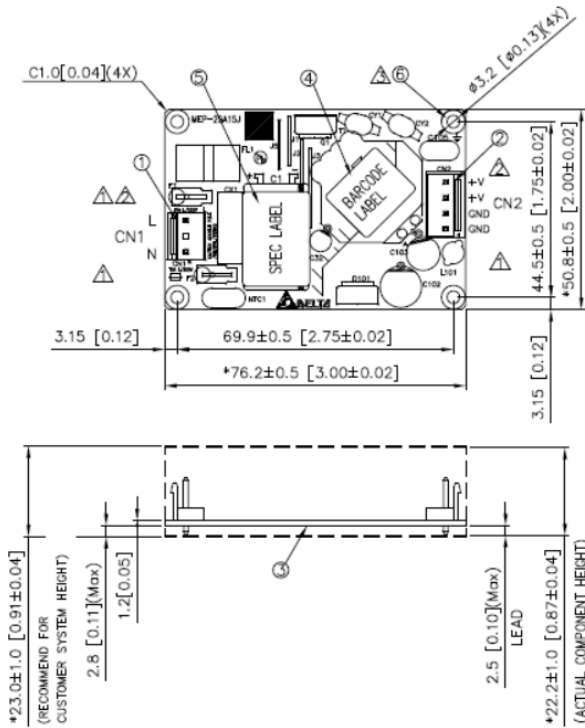
3) Asymmetrical: Common mode (Line to earth)

4) Symmetrical: Differential mode (Line to line)

Medical AC-DC Open Frame MEP-25A15J □ / 15V 25W

Dimensions

W x L x H: 50.8 x 76.2 x 23.0 mm (2.0 x 3.0 x 0.91 inch)

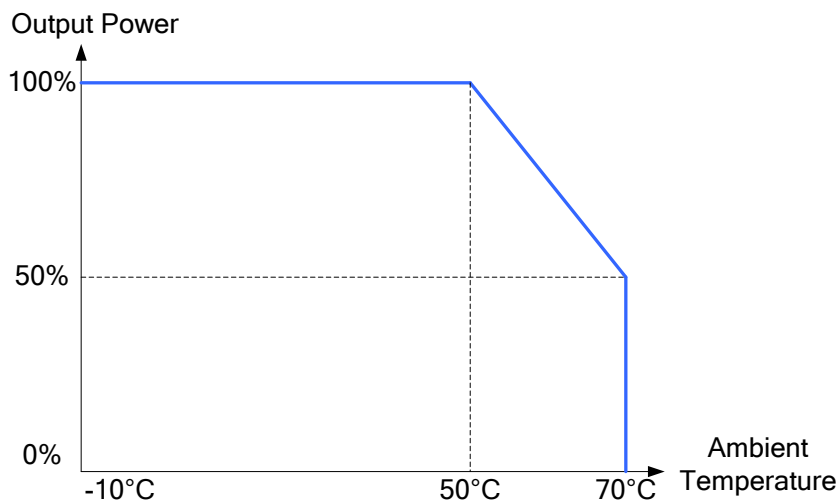


Notes - Dimensions are in mm (inches)

TAB.1 COMPONENT TABLE

ITEM	PART NAME	COLOR
①	AC INPUT (CN1) JST: B2P3-VH(LF)(SN) OR EQUIVALENT (middle terminal should be blank) MATING WITH JST: VHR-3N OR EQUIVALENT	WHITE
②	DC OUTPUT (CN2) JST: B4P-VH(LF)(SN) OR EQUIVALENT MATING WITH JST: VHR-4N OR EQUIVALENT	WHITE
③	PCB	—
④	BARCODE LABEL	WHITE
⑤	SPEC LABEL	WHITE
⑥	CLASS I PE PIN	—

Power De-rating



Medical AC-DC Open Frame

MEP-25A15J □ / 15V 25W

Functions

Start-up Time

The time required for the output voltage (V_o) to reach 90% of its set value, after the input AC voltage is applied.

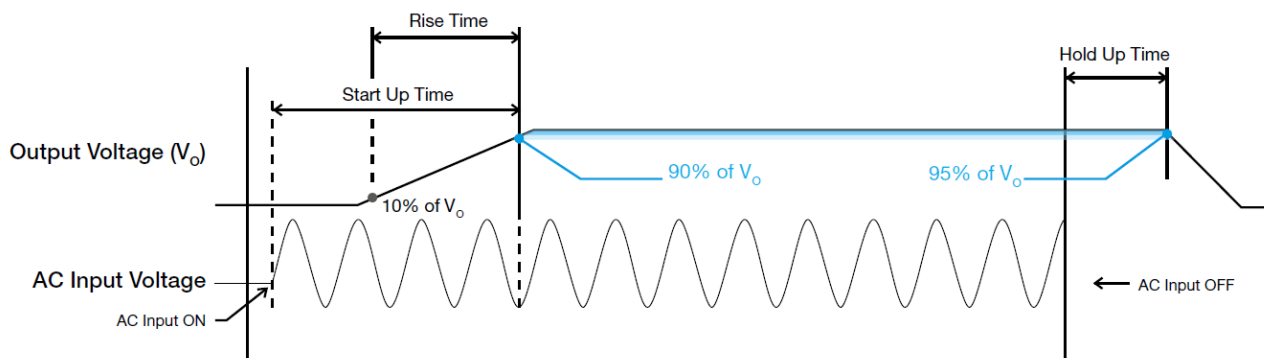
Rise Time

The time required for the output voltage (V_o) to change from 10% to 90% of its steady state value.

Hold-up Time

Hold up time is the time when the AC input collapses and output voltage retains regulation for a certain period of time. The time required for the output to reach 95% of its set value, after the input voltage is removed.

■ Graph illustrating the Start-up Time, Rise Time, and Hold-up Time

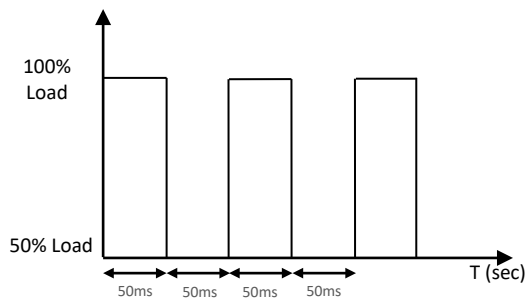


Medical AC-DC Open Frame

MEP-25A15J □ / 15V 25W

Dynamic Response

The power supply output voltage will remain within $\pm 3\%$ of its steady state value, when subjected to a dynamic load change from 50 to 100% of its rated current.



Overvoltage Protection

The power supply's overvoltage circuit will be activated when its internal feedback circuit fails. The output voltage shall not exceed its specifications defined on Page 3 under "Protections". Power supply will latch off, and require removal/re-application of input AC voltage in order to restart.

Short Circuit Protection

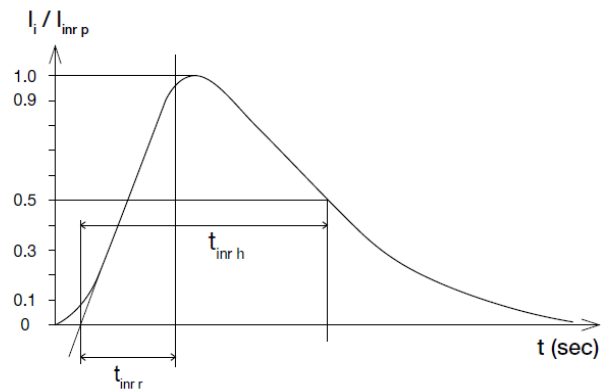
The power supply's output OLP/OCP function also provides protection against short circuits. When a short circuit is applied, the output current will operate in "Hiccup mode", as shown in the illustration in the OLP/OCP section on this page. The power supply will return to normal operation after the short circuit is removed.

Over Temperature Protection

As mentioned above, the power supply also has Over Temperature Protection (OTP). This is activated when the overload condition persists for an extended duration and the output current is below the overload trigger point but $>100\%$ load. In the event of a higher operating condition at 100% load, the power supply will run into OTP when the surrounding air temperature is higher than the operating temperature. When activated, the output voltage will go into hiccup mode until the input voltage is removed; then, reapplied, and the surrounding air temperature drops to its normal operating temperature.

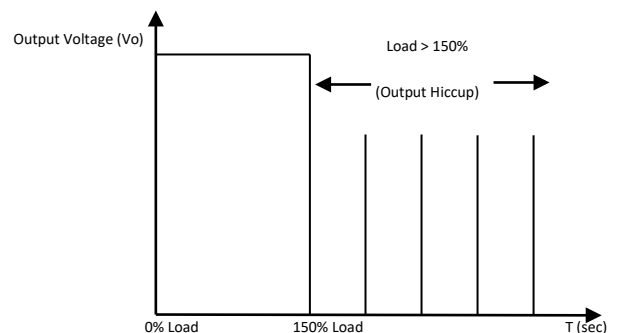
Inrush Current

Inrush current is the input current that occurs when the input voltage is first applied. For AC input voltages, the maximum peak value of inrush current will occur during the first half cycle of the applied AC voltage. This peak value decreases exponentially during subsequent cycles of AC voltage.



Overload & Over current Protections

The power supply's Overload (OLP) and Over current (OCP) Protections will be activated when output current is between 150% and 210% of I_o (Max load). Upon such an occurrence, V_o will start to drop. Once the power supply has reached its maximum power limit, the protection will be activated, and the power supply will go into "Hiccup mode" (Auto-Recovery). The power supply will recover once the fault condition causing the OLP and OCP is removed and I_o is back within the specified limit.



Additionally, if the I_o is $<210\%$ but $>150\%$ for a prolonged period of time (depending on the load), the Over Temperature Protection (OTP) will be activated due to high temperature on critical components. The power supply will then go into hiccup mode until the fault is removed; and, the input voltage is removed, then reapplied.

Medical AC-DC Open Frame

MEP-25A15J □ / 15V 25W

Certificate



Delta has been certified as meeting the requirement of ISO 13485: 2003 and EN ISO 13485:2012 for the design and manufacture of switching power supply and adaptor for medical device.



In addition to a UL Total Certification Program (TCP) approved client laboratory for IEC60950. Delta also has participated UL Client Test Data Program (CDTP) for IEC 60601

Attention

Delta provides all information in the datasheets on an "AS IS" basis and does not offer any kind of warranty through the information for using the product. In the event of any discrepancy between the information in the catalog and datasheets, the datasheets shall prevail (please refer to www.DeltaPSU.com for the latest datasheets information). Delta shall have no liability of indemnification for any claim or action arising from any error for the provided information in the datasheets. Customer shall take its responsibility for evaluation of using the product before placing an order with Delta.

Delta reserves the right to make changes to the information described in the datasheets without notice.