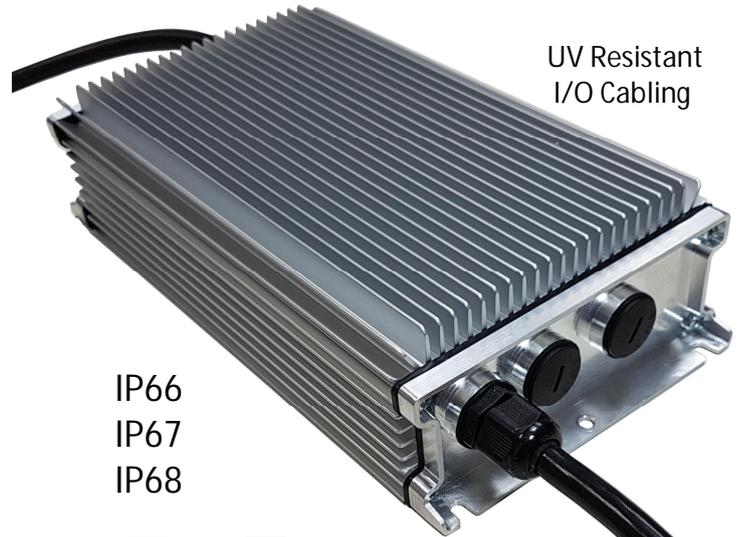


## KEY FEATURES

- Sealed enclosure, IP66/67/68 Ingress Protection grade
- High efficiency ( 94% from 50% load on)
- Low stand-by power consumption (< 0.3 W)
- Universal input voltage range (85 – 264 V<sub>AC</sub>)
- Input inrush current limiting (<30 A)
- 800 W peak power (up to 10 s)
- Single 24, 28, 36, 48 and 52 V<sub>DC</sub> voltages
- Active PFC, EN61000-3-2 compliant (Class C, >25% load)
- Low earth / touch leakage current
- Over temperature, OV, OC and SC protections.
- Stand by +5 V, 1.5 A output.
- Remote On / Off signal
- Medical safety approval to IEC 60601-1 3<sup>rd</sup> edition, 2xMoPP protection grade BF appliances compatible.
- IEC 60601-1-2 4<sup>th</sup> edition EMC compliant.
- RoHS 2 compliant (Directive 2011/65/EU)


 IP66  
 IP67  
 IP68


## DESCRIPTION

The MDP600 SC Series of medical grade AC-DC power supplies provides the compact form factor, ingress protection index and high efficiency that the marketplace demands.

It provides a steady 600 W of regulated DC power through the full 85 to 264 V<sub>AC</sub> input range, all in a 4.92 X 9.47 X 2.36" form factor. The MDP600 SC series is available in an aluminium extruded chassis having fins for an optimal heat dispersion via natural convection. Being its PWA assembling full potted within the enclosure, it offers a base plate that, once installed in contact with a system metallic frame, can be an effective path to dispel heat also through conduction helping thermal management. The input / output connections are by flying wires fixed to the chassis through water tight glands which combined with the sealed enclosure give the power supply an IP66/67/68 ingress protection grade (IP68 characterized as 1 m depth for 40 days).

By converting energy at up to 94% efficiency, the MDP600 SC series generates less heat, facilitating optimal thermal management in space constrained environments, resulting in very high reliability.

The MDP600 SC standard variant (S) comes in a 24 and 48 V<sub>DC</sub> (28, 36, and 52 V<sub>DC</sub> upon request) main output voltages. The option variant (P) offers in addition, a +5 V<sub>DC</sub> stand-by output and the following control signals: +/- remote sense, remote On/Off (PS\_Inhibit), power good (PS\_Ok), I-share (ISHARE1+V\_SLOGIC).

The power unit can be operated in a -30 to 70 °C ambient temperature being the output power de-rated above certain limits depending on the input AC. It provides UV resistant Input / Output cabling.

Protection features include High Breaking capacity fuses on both AC lines, input under voltage lockout (IUUV), output over-current (OC), output short-circuit (SC), output over-voltage (OV) and over-temperature (OT).

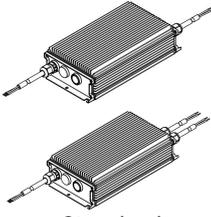
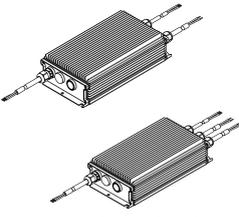
The MDP600 SC series complies with the 3<sup>rd</sup> edition of the IEC60601-1 safety standard for medical equipment, offers 2x MoPP means of patient protection and is suitable for BF rated applied parts.

The MDP600 SC series meets the EN 55011 and EN 60601-1-2 EMC limits of Class B for conducted and radiated emissions as well as the IEC/EN61000-3, for harmonic and flicker, and IEC/EN 60601-1-2 4<sup>th</sup> edition for EMC immunity standards.

## MARKET SEGMENTS AND APPLICATIONS

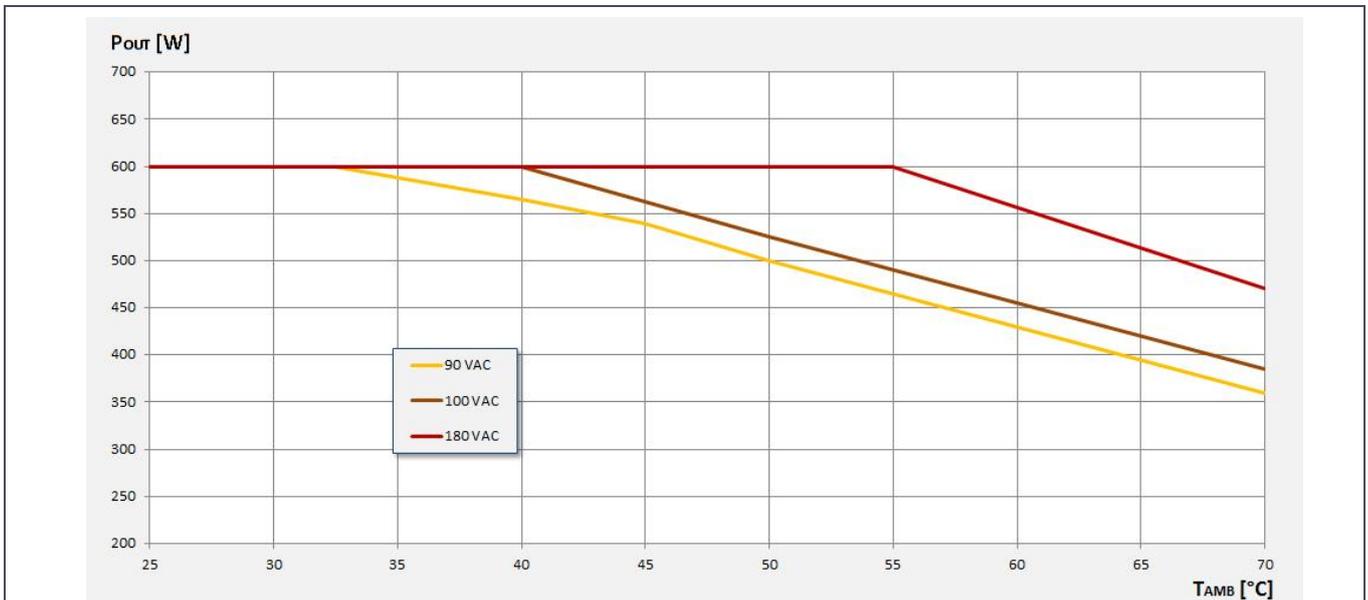
- Clinical Analysers
- Dental units / chairs
- MRI / Full Body TC Systems
- Medical Diagnostic & Imaging Systems


**MODEL CODING AND OUTPUT RATINGS**

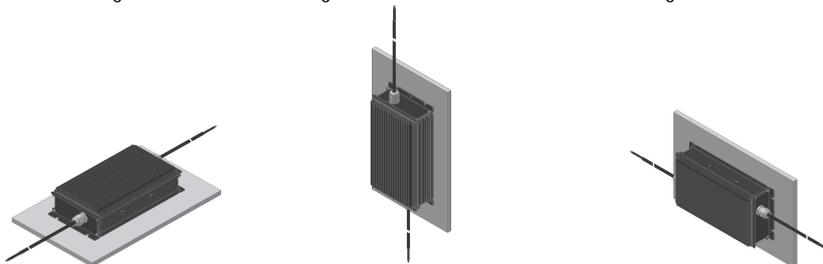
| Model Grade and Output Power | Output Voltages  |                       | Packages   |  |
|------------------------------|--|-----------------------|--|--|
| ME: MDP600-                  | 24 V <sub>DC</sub> : US24-<br>28 V <sub>DC</sub> : US28-<br>36 V <sub>DC</sub> : US36-<br>48 V <sub>DC</sub> : US48-<br>52 V <sub>DC</sub> : US52- | Sealed<br>Chassis: SC | <br>Standard | <br>Signals: -S |

| Model Code          | V <sub>1</sub><br>Nominal<br>[V <sub>DC</sub> ] | I <sub>1</sub><br>Rated (*)<br>[A] |       | I <sub>STBY</sub><br>Rated (*)<br>[A] |       | Cooling<br>[LFM]      | Max Combined<br>Output Power (*)<br>[W] |       |
|---------------------|---|------------------------------------|-------|---------------------------------------|-------|-----------------------|---|-------|
|                     |   | 55 °C                              | 70 °C | 55 °C                                 | 70 °C |                       | 55 °C                                   | 70 °C |
| MDP600-US24-SC (-S) | 24  | 25                                 | 17.5  | 1.5                                   | 1.5   | Natural<br>Convection | 600                                     | 470   |
| MDP600-US28-SC (-S) | 28  | 21.4                               | 15    | 1.5                                   | 1.5   | Natural<br>Convection | 600                                     | 470   |
| MDP600-US36-SC (-S) | 36  | 16.7                               | 11.7  | 1.5                                   | 1.5   | Natural<br>Convection | 600                                     | 470   |
| MDP600-US48-SC (-S) | 48  | 12.5                               | 8.75  | 1.5                                   | 1.5   | Natural<br>Convection | 600                                     | 470   |
| MDP600-US52-SC (-S) | 52  | 11.5                               | 8     | 1.5                                   | 1.5   | Natural<br>Convection | 600                                     | 470   |

(\*) – Rated currents and combined power are referred to 55 °C ambient and V<sub>AC</sub> ≥ 180 V<sub>RMS</sub>.


**OUTPUT DE-RATING CURVES**


The above de-rating curves are effective regardless the MDP600-US48-SC mounting orientation




**INPUT SPECIFICATIONS**

| Specification                                | Test Conditions / Notes  | Min.                | Nominal        | Max.          | Units            |   |
|--|--|---------------------|----------------|---------------|------------------|---|
| AC Input Voltage                             | PS starts and operates at 85 V <sub>AC</sub> at all load conditions  | 85                  | 100-277        | 264           | V <sub>RMS</sub> |   |
| DC Input Voltage                             |  | 170                 | -              | 300           | V <sub>DC</sub>  |   |
| Input Frequency                              | 440 Hz with reduced PFC and output power rating - Consult factory for details.   | 47                  | 50/60          | 440           | Hz               |   |
| Input Current                                | RMS at 180 V <sub>AC</sub> , maximum load, 50 / 60 Hz<br>RMS at 85 V <sub>AC</sub> , maximum load, 50 / 60 Hz  | -                   | -              | 4.0<br>8.5    | A                |   |
| Inrush Current                               | Cold start, 25 °C ambient, full load   |                     |                |               |                  |   |
|  |  | 115 V <sub>AC</sub> | -              | -             | 20               |   |
|  |  | 230 V <sub>AC</sub> | -              | -             | 30               |   |
| Fusing                                       | High breaking, 10A, 250V on each AC lines.   | -                   | -              | 10            | A                |   |
| Efficiency                                   | At 115 V <sub>AC</sub> , 20% rated load<br>50% rated load<br>100% rated load   | -                   | 89<br>93<br>92 | -             | %                |   |
|  | At 230 / 264 V <sub>AC</sub> , 20% rated load<br>50% rated load<br>100% rated load   | -                   | 90<br>94<br>94 | -             |                  |   |
| Input Power Consumption                      | Power on, 115 V <sub>AC</sub> , no load<br>Power on, 230 V <sub>AC</sub> , no load<br>Stand by, 115, 230 V <sub>AC</sub> , no load   | -                   | -              | 5<br>4<br>0.3 |                  | W |
| Power Factor                                 | From 50 to 100% of rated load,<br>230, 115 V <sub>AC</sub> , 50 / 60 Hz<br>input voltages.   | 0.90                | -              | -             |                  | - |
| THDi   | From 50 to 100% rated load, 115, 230, 264 V <sub>AC</sub> 50 / 60 Hz.  | -                   | -              | 20            |                  | % |
| Harmonic Current<br>Fluctuations and Flicker | Complies with EN 61000-3-2 at 230 V <sub>AC</sub> , 50/60 Hz, Class A, D.<br>Complies with EN 61000-3-2 Class C at 230 V <sub>AC</sub> , 50/60 Hz, >150 W load.<br>Complies with EN 61000-3-3 at nominal voltages and full load. |                     |                |               |                  |   |
| Earth Leakage Current                        | Normal conditions  |                     |                |               |                  |   |
|  | 115 V <sub>RMS</sub> , 60 Hz   | -                   | 130            | -             | μA               |   |
|  | 230 V <sub>RMS</sub> , 50 Hz   | -                   | 240            | -             |                  |   |
|  | 264 V <sub>RMS</sub> , 60 Hz (worst case)  | -                   | -              | 400           |                  |   |

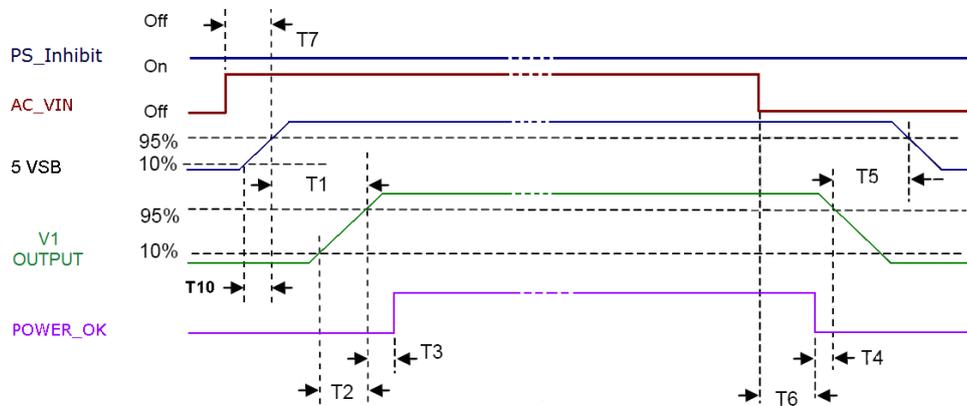

**OUTPUT SPECIFICATIONS**

| Specification  | Test Conditions / Notes   | Min. | Nom. | Max.  | Units             |
|--|---|------|------|-------|-------------------|
| V1 Output Voltages   | ±0.5% set point accuracy  | -    | 24   | -     |                   |
|  | RS+ closed on +V1, RS- closed on V1 RTN,  | -    | 28   | -     |                   |
|  | at 20% load on option variant (P).  | -    | 36   | -     | V                 |
|  |   | -    | 48   | -     |                   |
|  |   | -    | 52   | -     |                   |
| V1 Output Power Rating   | Convection cooling  | -    | -    | 600   |                   |
|  | (Refer to the de-rating curves below)   |      |      |       | W                 |
| 5V <sub>SB</sub> Output Voltage                                  | Peak (less than 10 s, after P_OK high)  | -    | -    | 800   |                   |
|  | ±3% set point accuracy, 20% load.   | -    | 5    | -     | V                 |
| 5V <sub>SB</sub> Output Current                                  |   | -    | -    | 1.5   | A                 |
| V1 Voltage Adjustment Range                                      | Factory calibration upon customer request   | -    | -    | ±5    | %V1               |
| V1 Load-Line-Cross Regulation                                    | V <sub>AC</sub> : 85 – 264 V <sub>RMS</sub> ; I1: 0 – 100%  | -    | -    | ±2    | %V1               |
| 5V <sub>SB</sub> Load-Line-Cross regulation                      | V <sub>AC</sub> : 85 – 264 V <sub>RMS</sub> ; I <sub>5SB</sub> : 0 – 100%   | -    | -    | ±5    | %5V <sub>SB</sub> |
| V1 Line Regulation   | V <sub>AC</sub> : 85 – 264 V <sub>RMS</sub>   | -    | -    | ±0.1  | %V1               |
| Transient Response:<br>V1, 5V <sub>SB</sub><br>Voltage Deviation | 25% load changes at 1 A/μs  |      |      |       |                   |
|  | 24V at 1000 μF load / I <sub>OUT</sub> > 2.5 A  |      |      |       |                   |
|  | 28V at 1000 μF load / I <sub>OUT</sub> > 2.5 A  |      |      |       |                   |
|  | 36V at 680 μF load / I <sub>OUT</sub> > 1.9 A   | -    | -    | ±5    | %V1               |
|  | 48V at 560 μF load / I <sub>OUT</sub> > 1.25 A  |      |      |       | %5V <sub>SB</sub> |
|  | 52V at 560 μF load / I <sub>OUT</sub> > 1.25 A  |      |      |       |                   |
| V1 Ripple and Noise  | 5V <sub>SB</sub> at 560 μF load / I <sub>OUT</sub> > 0.1 A  |      |      |       |                   |
|  | Rated load, Peak-to-peak, 20 MHz BW.<br>(100 nF ceramic, 10 μF tantalum at load) (*)  | -    | -    | 1     | %V1               |
| V1 Start-up Rise Time  | 85<V <sub>IN</sub> <264, any load conditions.   | 10   | -    | 100   | ms                |
| Start-up Delay   | V1 in regulation after de-asserting PS_Inhibit  | -    | -    | 450   |                   |
|  | V1 in regulation after AC is applied<br>(worst case: 85 V <sub>AC</sub> )   | -    | -    | 2050  | ms                |
|  | 5V <sub>SB</sub> in regulation after AC is applied<br>(worst case: 85 V <sub>AC</sub> )   | -    | -    | 1500  |                   |
| Turn-on Overshoot  |   | -    | -    | 10    | %V1               |
|  |   | -    | -    | 10    | %V <sub>SB</sub>  |
| V1 Hold-up Time  | At nominal V <sub>IN</sub> , full load  | 16   | -    | -     | ms                |
| Minimum Load   | V1 and 5V <sub>SB</sub>   | 0    | -    | -     | A                 |
| Maximum Load Capacitance   | V1: 24 V <sub>DC</sub>  | -    | -    | 16000 |                   |
|  | V1: 28 V <sub>DC</sub>  | -    | -    | 15000 |                   |
|  | V1: 36 V <sub>DC</sub>  | -    | -    | 12000 | μF                |
|  | V1: 48 V <sub>DC</sub>  | -    | -    | 8000  |                   |
|  | V1: 52 V <sub>DC</sub>  | -    | -    | 7000  |                   |
| V1 Current Sharing Accuracy                                      | Two units in parallel at I1 rated load.<br>VS-Logic and I-Share signals connected together.<br>RS+, RS- signals connected together and to the load. | 45.5 | -    | 54.5  | %I1               |

## SIGNALS / CONTROLS AND TIMING

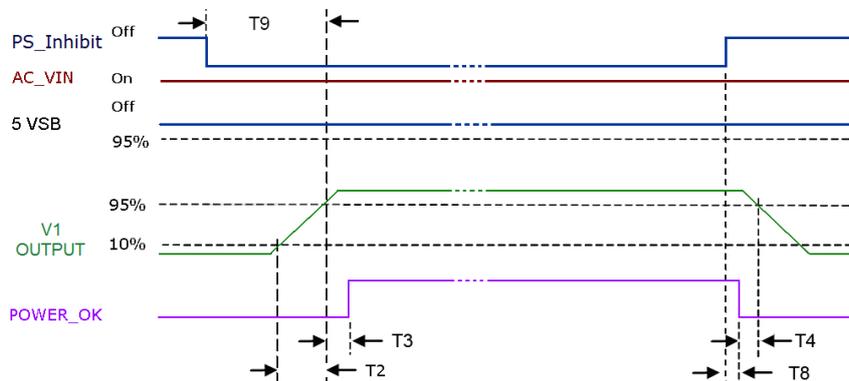
| Signal                  | Notes  | Min | Typ. | Max  | Unit |
|-------------------------|--|-----|------|------|------|
| +PS_Inhibit             | Active high. Input low voltage   | 0   | -    | 1.5  | V    |
|                         | Input high voltage ( $I_{IN} = 300 \mu A$ )  | 3.5 | -    | 5.5  | V    |
|                         | V1 and V2 disabled when PS_Inhibit is pulled high<br>5V <sub>SB</sub> not affected by PS_Inhibit |     |      |      |      |
| -PS_Inhibit             | V1 and V2 enabled when PS_Inhibit is open or low   |     |      |      |      |
| P_OK*                   | Active low (reverse control, same voltage levels)  |     |      |      |      |
|                         | Logic level low (<10 mA sinking)   | -   | -    | 0.7  | V    |
| 5V <sub>SB</sub> Output | Logic level high (100 $\mu A$ sourcing)  | 2.4 | -    | 5.5  | V    |
|                         | Low to high time after V1 in regulation  | 40  | -    | 350  | ms   |
|                         | Power down warning time  | 1   | -    | -    | ms   |
| 5V <sub>SB</sub> Output | Active and in regulation after a $85 < V_{AC} < 264$ is applied                                  | -   | -    | 1500 | ms   |
|                         | 5V <sub>SB</sub> not affected by PS_Inhibit  |     |      |      |      |

\* When V1 is On, a P\_OK low may indicate V1 under voltage condition. When two MDP600 operate in parallel, P\_OK low in one unit indicates that it is not sharing the expected amount of current (current sharing fault). A 10 k $\Omega$  internal pull up to 5V<sub>SB</sub> is used; do not add any other external pull up.



Above waveforms are expected with AC Input ON/OFF:

|                                       |  |
|---------------------------------------|--|
| 5V <sub>SB</sub> On – V1 On           | $250 \text{ ms} \leq T1 \leq 550 \text{ ms}$ |
| V1 rise time                          | $10 \text{ ms} \leq T2 \leq 100 \text{ ms}$  |
| 5V <sub>SB</sub> rise time            | $3 \text{ ms} \leq T10 \leq 40 \text{ ms}$   |
| V1 On – POWER_OK delay                | $200 \text{ ms} \leq T3 \leq 350 \text{ ms}$ |
| Power down warning                    | $T4 \geq 1 \text{ ms}$                       |
| V1 Off – 5V <sub>SB</sub> Off         | $T5 \geq 0.5 \text{ s (V1 load > 25 W)}$     |
| AC Off – POWER_OK low                 | $T6 \geq 15 \text{ ms}$                      |
| AC On – 5V <sub>SB</sub> turn on time | $T7 \leq 1.5 \text{ s}$                      |



Above waveforms are expected with PS\_Inhibit Signal On/Off state change:

|                                  |  |
|----------------------------------|--|
| V1 rise time                     | $10 \text{ ms} \leq T2 \leq 100 \text{ ms}$  |
| V1 On – POWER_OK delay           | $200 \text{ ms} \leq T3 \leq 350 \text{ ms}$ |
| Power down warning               | $T4 \geq 1 \text{ ms}$                       |
| PS_Inhibit – POWER_OK low timing | $T8 \leq 2 \text{ ms}$                       |
| PS_Inhibit – V1 On delay         | $T9 \leq 450 \text{ ms}$                     |


**PROTECTION FEATURES**

| Specification                           | Test Conditions / Notes                          | Min.    | Nominal | Max. | Units               |
|---|--|---------|---------|------|---------------------|
| Input Under Voltage                     | Auto-recovering                                  | 58      | 65      | 75   | V <sub>AC</sub>     |
| Input Fuse                              | High breaking, 10A, 250V on L and L1.            | -       | -       | 10   | A                   |
| Over Current                            | At nominal input voltages                        |         |         |      |                     |
|   | V1: Hiccup mode, auto-recovering (>10 s)         | 108     | -       | 132  | %I <sub>Rated</sub> |
|   | V1: Hiccup mode, auto-recovering (<10 s)         | 135     | -       | 163  | %I <sub>Rated</sub> |
|   | 5V <sub>SB</sub> : Hiccup mode, auto-recovering: | 1.6     | -       | 3.6  | A                   |
| Short Circuit                           | At nominal input voltages                        |         |         |      |                     |
|   | V1: Hiccup mode, auto-recovering.                | -       | -       | -    |                     |
|   | 5V <sub>SB</sub> : Hiccup mode, auto-recovering. | -       | -       | -    |                     |
| Over Voltage                            | V1, Power shut down, latch off.                  | 120     | -       | 145  | %V <sub>NOM</sub>   |
|   | 5V <sub>SB</sub> , Hiccup mode, auto-recovering. | -       | -       | 150  |                     |
| Over Temperature<br>(on primary stage)  | Shut down, latch off.                            | -       | -       | -    | °C                  |
| Over Temperature<br>(on secondary side) | Hiccup mode, auto-recovering.                    | -       | -       | -    | °C                  |
| Isolation: Input-to-Output              | Reinforced (2XMoPP)                              | 5660    | -       | -    | V <sub>DC</sub>     |
|   | Production tested at 4242 V <sub>DC</sub>        | 4000    | -       | -    | V <sub>AC</sub>     |
| Isolation: Input-to-Earth               | Basic (1XMoPP)                                   | 2121    | -       | -    | V <sub>DC</sub>     |
|   | Production tested at 2121 V <sub>DC</sub>        | 1500    | -       | -    | V <sub>AC</sub>     |
| Isolation: V1-to-5V <sub>SB</sub>       | Basic  | 100     | -       | -    | V <sub>AC</sub>     |
| Isolation: Output-to-Earth              | Basic (1XMOPP)                                   | 1500    | -       | -    | V <sub>AC</sub>     |
| Equipment Protection Class              |  | Class I |         |      |                     |


**ENVIRONMENTAL SPECIFICATIONS**

| Specification                              | Test Conditions / Notes   | Min    | Nominal | Max  | Units |
|--|---|--------|---------|------|-------|
| Operating Temperature Range                | No de-rating up to 55°C, at ≥ 180 V <sub>AC</sub>   | -30    | -       | 55   | °C    |
| Operating Temperature Range with De-rating | See de-rating curves and conditions in the Output Specifications section                      | -      | -       | 70   | °C    |
| Storage Temperature                        |   | -40    | -       | 85   | °C    |
| Humidity                                   | RH, Non-condensing Operating.   | -      | -       | 90   | %     |
|  | Non-operating   | -      | -       | 95   | %     |
| Operating Altitude                         | Medical grade MoPP (100-277 V <sub>AC</sub> , 50/60 Hz)                                       | -      | -       | 4000 | m     |
|  | IT grade MoOP   | -      | -       | 5000 |       |
| Shock                                      | EN 60068-2-27   |        |         |      |       |
|  | Operating: Half sine, 30 g, 18 ms, 3 axes, 6x each (3 positive and 3 negative).               |        |         |      |       |
|  | Non-Operating: Half sine, 50 g, 11 ms, 3 axes, 6x each (3 positive and 3 negative).           |        |         |      |       |
| Vibration                                  | EN 60068-2-64   |        |         |      |       |
|  | Operating: Sine, 10 – 500 Hz, 1 g, 3 axes, 1 oct/min., 60 min.                                |        |         |      |       |
|  | Random, 5 – 500 Hz, 0.02 g <sup>2</sup> /Hz, 1 g <sub>RMS</sub> , 3 axes, 30 min.             |        |         |      |       |
|  | Non-Operating: 5 – 500 Hz, 2.46 g <sub>RMS</sub> (0.0122 g <sup>2</sup> /Hz), 3 axes, 30 min. |        |         |      |       |
| MTBF                                       | Full Load, 40 °C ambient  | 300000 | -       | -    | Hours |
|  | 80% Duty cycle, Telcordia SR-332 Issue 2  |        |         |      |       |
| Useful Life                                | Worst nominal V <sub>IN</sub> , 80% load, 40 °C ambient.                                      | -      | 5       | -    | Years |
|  | Worst nominal V <sub>IN</sub> , 55% load, 40 °C ambient.                                      | -      | 10      | -    |       |


**ELECTROMAGNETIC COMPATIBILITY (EMC) – EMISSIONS**

| Phenomenon                           | Conditions / Notes   | Standard  | Equipment/Performance Class |
|--------------------------------------|--|---|-----------------------------|
| Conducted                            | 115, 230, 277 V <sub>RMS</sub> . Maximum load.               | EN 55011 (ISM)<br>EN 60601-1-2 (Medical)<br>FCC Part 15 | B                           |
| Radiated                             |  | EN 55011 (ISM)<br>EN 60601-1-2 (Medical)<br>FCC Part 15 | B                           |
| Line Voltage Fluctuation and Flicker | At 20%, 50% and 100% maximum load.<br>Nominal input voltages | EN 61000-3-3  |                             |
| Harmonic Current                     | 230 V <sub>AC</sub> input voltage, 50 / 60 Hz                | EN 61000-3-2  | A, D                        |
| Emission                             | 230 V <sub>AC</sub> 50 / 60 Hz, >150 W load                  | EN 61000-3-2  | C                           |


**ELECTROMAGNETIC COMPATIBILITY (EMC) – IMMUNITY**

| Phenomenon              | Conditions / Notes   | Standard      | Test Level | Criteria             |
|-------------------------|--|---------------|------------|----------------------|
|                         | Reference standard for the medical version                     | EN 60601-1-2  |            |                      |
| ESD                     | 15 kV air discharge, 8 kV contact, at any point of the system. | EN 61000-4-2  | 4          | A                    |
| Radiated Field          | 10 V/m, 80-1000 MHz, 1 KHz, 80% AM.                            | EN 61000-4-3  | 3          | A                    |
| Electric Fast Transient | ±2 kV on AC power port   | EN 61000-4-4  | 3          | A                    |
| Surge                   | ±2 kV line to line; ± 4 kV line to earth on AC power port      | EN 61000-4-5  | 4          | A                    |
| Conducted RF Immunity   | 10 V <sub>RMS</sub> , 0, 15-80 MHz, 1 kHz, 80% AM              | EN 61000-4-6  | 3          | A                    |
| Dips and Interruptions  | 200 – 277 V <sub>AC</sub> :<br>Drop-out to 0% for 10 ms        | EN61000-4-11  |            | A                    |
|                         | Dip to 40% for 5 cycles (100 ms)                               | EN61000-4-11  |            | A                    |
|                         | Dip to 70% for 25 cycles (500 ms)                              | EN61000-4-11  |            | A                    |
|                         | Drop-out to 0% for 5 s   | EN61000-4-11  |            | B                    |
|                         | 100 – 127 V <sub>AC</sub> :<br>Drop-out to 0% for 10 ms        | EN 61000-4-11 |            | A                    |
|                         | Dip to 40% for 5 cycles (100 ms)                               | EN 61000-4-11 |            | A (de-rate to 150 W) |
|                         | Dip to 70% for 25 cycles (500 ms)                              | EN 61000-4-11 |            | A (de-rate to 400 W) |
|                         | Drop-out to 0% for 5 s   | EN 61000-4-11 |            | B                    |

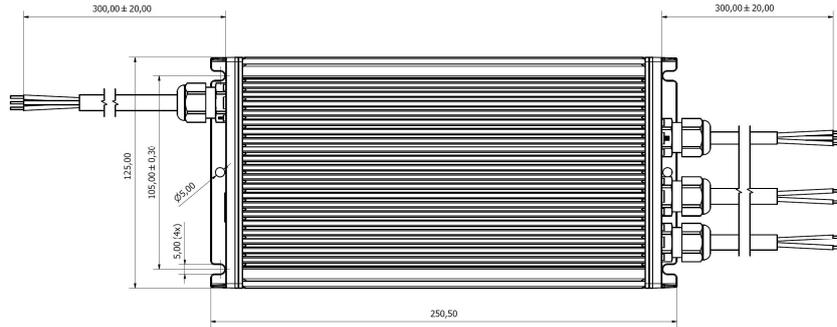
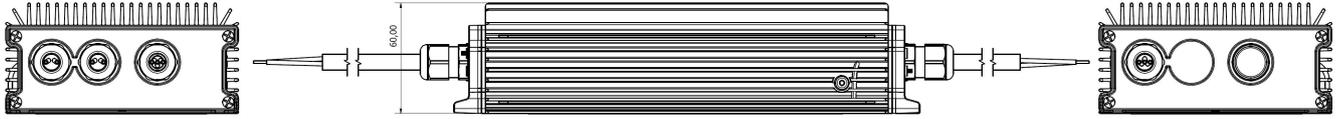

**SAFETY AGENCIES APPROVALS**

| Certification Body   | Safety Standards and file numbers  | Category |
|--|--|----------|
| CSA/UL   | CSA C22.2 No.60601-1, ANSI/AAMI ES60601-1 3 <sup>rd</sup> edition + A1<br>Including Risk Management Assessment | Medical  |
| IEC IECEE  | IEC/EN 60601-1 3 <sup>rd</sup> edition+A1  | Medical  |
| CB Certification   | Including Risk Management Assessment   | Medical  |
| CE   | Directive 93/42/CEE: Safety Requirement of the Medical Device  | Medical  |
|  | Directive 2014/30/EU: Electromagnetic Compatibility (EMC)  |          |
|  | Directive 2011/65/EU: RoHS 2   |          |
| Designed to meet IEC/EN/UL/CSA 61010-1 2 <sup>nd</sup> edition |  |          |

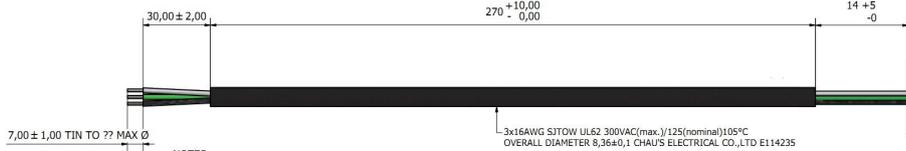
**OUTLINE DRAWING AND CONNECTIONS**

Overall dimensions: (125.0 X 250.5 X 60.0) mm; (4.92 X 9.86 X 2.36) in

Weight: 2770 g; 6.11 lb (Standard); 2850 g; 6.28 lb (Signals S)

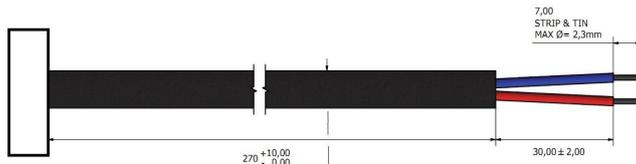


**Input cable**

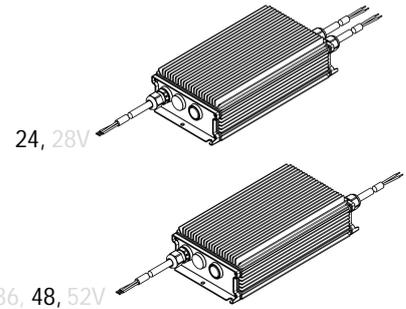


NOTES  
 -This cable assembly to be manufactured according to UL's Recognition Service under the category of wiring harnesses (ZPFW2, ZPFW8).  
 - ATTENTION: this product must meet the EU RoHS-2 (Directive 2011/65/EU of the European Parliament and of the Council) (Restriction of hazardous substances directive) and must be in compliance with the REACH regulation (European Union Regulation No 1907/2006).  
 SUITABLE CORE TYPES:  
 RICHCO RT 236-114-140 K5B  
 WURTH 7427012 2  
 KITAGAWA GTR 23-11-14  
 3x16AWG SJTOW UL62 300VAC(max.)125(nominal)105°C OVERALL DIAMETER 8,36±0,1 CHAU'S ELECTRICAL CO.,LTD E114235

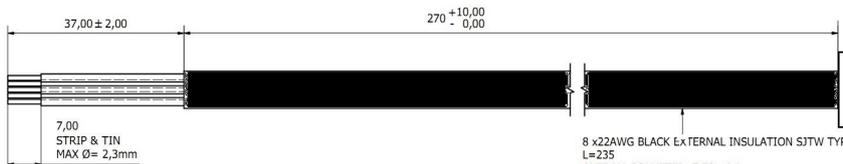
**Output Cable Standard Version**



NOTES  
 -This cable assembly to be manufactured according to UL's Recognition Service under the category of wiring harnesses (ZPFW2, ZPFW8).  
 - ATTENTION: this product must meet the EU RoHS-2 (Directive 2011/65/EU of the European Parliament and of the Council) (Restriction of hazardous substances directive) and must be in compliance with the REACH regulation (European Union Regulation No 1907/2006).  
 -Dimension without indication of tolerances:Tolerances UNI ISO 2768-m.  
 UL SJTW 2x14AWG 105°C/300V, WATER RESISTANT 60°C STRANDED BLACK EXT. INSULATION CORD OVERALL DIAMETER: 8.6mm MIN, 9.5mm MAX.  
 APPROVED CABLE MANUFACTURERS:  
 VERCAVI 9.2 ± 0.2  
 NINGBO JIAJIE ELECTRONIC 9.3± 0.2  
 CHAU'S (Guangdong Xiongrun electrical co. ltd) 8.70± 0.1  
 SUITABLE CORE TYPES:  
 LAIRD STEWARD 2880870-000  
 RICHCO RT 220-135-64 K5B  
 FAIR-RITE 2643801802  
 WURTH 74270119

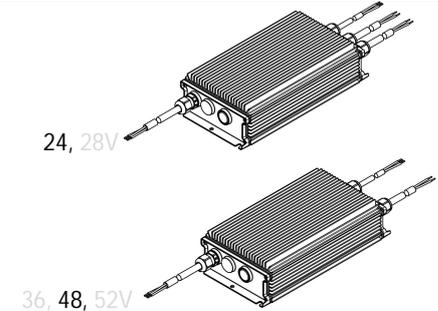


**Output Cable Signal Version**



| WIRE COLOR | SIGNAL NAME |
|------------|-------------|
| BROWN      | RS-         |
| RED        | +5Vsb       |
| BLACK      | RTN         |
| WHITE      | RS+         |
| LIGHT BLUE | ISHARE1     |
| PURPLE     | VS_LOGIC    |
| YELLOW     | -PSINHIBIT  |
| GREEN      | P_OK        |
| N.C.       | -           |

NOTES  
 -This cable assembly to be manufactured according to UL's Recognition Service under the category of wiring harnesses (ZPFW2, ZPFW8).  
 - ATTENTION: this product must meet the EU RoHS-2 (Directive 2011/65/EU of the European Parliament and of the Council) (Restriction of hazardous substances directive) and must be in compliance with the REACH regulation (European Union Regulation No 1907/2006).  
 8 x22AWG BLACK EXTERNAL INSULATION SJTW TYP L=235  
 OVERALL DIAMETER: 7.70 ±0.1  
 APPROVED WIRE TYPES:  
 VERCAVI srl PART# T68X22NE0050  
 CHAU'S ELECTRICAL CO.,LTD  
 PART# SJTW#22/8C 000BK D03502  
 SUITABLE CORE TYPES:  
 LAIRD STEWARD 2880870-000  
 RICHCO RT 220-135-64 K5B  
 FAIR-RITE 2643801802  
 WURTH 74270119



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 REVISION HISTORY

| Rev. | Date                             | Originator   | Comments      |
|------|----------------------------------|--------------|---------------|
| 00   | November 10 <sup>th</sup> , 2017 | M. Petritoli | First release |
|      |                                  |              |               |
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