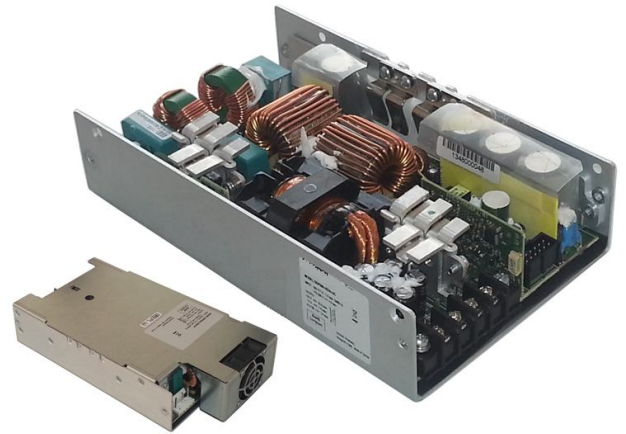


## MAIN FEATURES

- Universal input voltage range (85 – 305 V<sub>AC</sub>)
- Input surge current limiting
- 800 W peak power (up to 10 s)
- High efficiency up to 94%
- 24, 28, 36 and 48 V<sub>DC</sub> standard output voltages
- Low stand-by consumption (<0.35 W)
- Active PFC, EN61000-3-2 compliant (Class C, >25% load).
- Low earth / touch leakage current
- Fan speed control circuit
- Over temperature, OV, OC and SC protections.
- Stand by +5 V, 1.5 A and auxiliary / fan 12 V<sub>DC</sub>, 1 A outputs.
- Built-in current share signal for parallel operation
- Remote On / Off signal
- Power good and remote sense signals
- U-chassis and enclosed packages fits 1U applications
- Medical safety approval to IEC 60601-1 3<sup>rd</sup> edition, including Risk Management Assessment, 2x MoPP rated and BF appliances compatible.
- IEC 60601-1-2 4<sup>th</sup> edition EMC compliant.
- LED lighting safety approval to UL8750
- RoHS 3 compliant (Directive EU 2015/863)
- Medical version compatible with 4000 m altitude operation



## DESCRIPTION

The DDP600 series of industrial and medical grade AC-DC power supplies provide the compact form factor and high efficiency that the marketplace demands.

The series provides a steady 600 W of regulated DC power through the full 85 to 305 V<sub>AC</sub> input range, all in a 4.2 x 7.0 x 1.6" form factor. The DDP600 is available in a U-frame chassis or enclosed with a built-in front mounted fan to facilitate system integration.

By converting energy at up to 94% efficiency, the DDP600 generates less heat, facilitating optimal thermal management in space constrained environments, resulting in very high reliability.

The series comes in 24, 28, 36 and 48 V<sub>DC</sub> standard output voltages and offers auxiliary 12 V<sub>DC</sub> and +5 V<sub>DC</sub> stand-by outputs. Available control signals include Power Good (P\_OK), Remote On / Off (PS\_Inhibit) and Sense terminals (RS<sup>+</sup>, RS<sup>-</sup>).

The DDP600 features a built-in I-share circuit for parallel operation between power units to enhance total power. An optional OR-ing external circuit can be provided to allow N+1 redundant operation.

The enclosed unit can deliver full output power from -20 to 60 °C. The same is true for the U-frame variant when providing it with a 500 LFM airflow. Both units can be operated up to 70 °C with output power de-rating. When natural convection cooled, the U-frame variant can deliver a steady 400 W up to 50 °C ambient. A built-in fan speed control circuit in the enclosed version ensures proper air flow in every working environment, minimizing operational noise and enhancing its service life time.

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

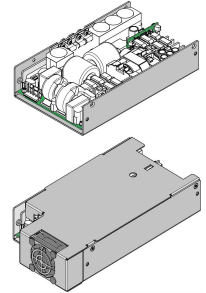
The DDP600 series complies with the 3<sup>rd</sup> edition of the IEC 60601-1 safety standard for medical equipment including Risk Management Assessment, offers 2x MoPP means of patient protection, and is suitable for BF rated applied parts under certain conditions. The series also complies with the 2<sup>nd</sup> edition of the IEC 60950-1 and IEC 62368-1 standards for Audio Video and IT equipment and UL8750 for lighting applications. The series meets the EN55032 EMC limits of Class B for conducted and radiated emissions as well as the IEC/EN 61000-3, IEC/EN 61000-4 and IEC/EN 60601-1-2 4<sup>th</sup> edition EMC standards.

## MARKET SEGMENTS AND APPLICATIONS

- Video Wall Display and SSL Lighting
- Industrial Process Control and Automation
- Telecommunications
- Laboratory / Analysis Equipment
- Test and Measurement Equipment
- Medical applications

## MODEL CODING AND OUTPUT RATINGS 1/2

Model Grade and Output Power	Output Voltages	Packages
ITE/ME: <b>DDP600-</b>	24 V <sub>DC</sub> : <b>US24-</b>	<i>U-Chassis: UC</i>
	28 V <sub>DC</sub> : <b>US28-</b>	
	36 V <sub>DC</sub> : <b>US36-</b>	<i>Front Fan Box: FF</i>
	48 V <sub>DC</sub> : <b>US48-</b>	



Model Code	V <sub>AC</sub> Range [V <sub>RMS</sub> ]	V1 Nominal [V <sub>DC</sub> ]	I1 [A]		I2 [A]		ISB [A]		Mounting Orientation	Cooling [LFM]	Max Combined Output Power [W]	
			50°C	70°C	50°C	70°C	50°C	70°C			50°C	70°C
DDP600-US24-FF <sup>1</sup>	85-305	24	25 <sup>1</sup>	20.84	1	0,5	1.5	1	-	-	600 <sup>1</sup>	500
DDP600-US24-UC	85-180	24	25	16.66	1	0.5	1.2	0.8	-	600	600	400
DDP600-US24-UC	180-305	24	25	16.66	1	0.5	1.2	0.8	-	500	600	400
DDP600-US24-UC	85-180	24	12.92	5.20	1	0.5	0.8	0.5	Horizontal	Nat. Conv.	310	125
DDP600-US24-UC	180-305	24	14.58	6.88	1	0.5	1	0.5	Horizontal	Nat. Conv.	350	165
DDP600-US24-UC	85-180	24	14.16	6.46	0.9	0.5	0.8	0.4	Vertical	Nat. Conv.	340	155
DDP600-US24-UC	180-305	24	16.25	8.12	1	0.5	0.9	0.4	Vertical	Nat. Conv.	390	195
DDP600-US28-FF <sup>2</sup>	85-305	28	21.4 <sup>2</sup>	17.86	1	0,5	1.5	1	-	-	600 <sup>2</sup>	500
DDP600-US28-UC	85-180	28	21.4	12.28	1	0.5	1.2	0.8	-	600	600	400
DDP600-US28-UC	180-305	28	21.4	12.28	1	0.5	1.2	0.8	-	500	600	400
DDP600-US28-UC	85-180	28	11.07	4.46	1	0.5	0.8	0.5	Horizontal	Nat. Conv.	310	125
DDP600-US28-UC	180-305	28	12.5	5.90	1	0.5	1	0.5	Horizontal	Nat. Conv.	350	165
DDP600-US28-UC	85-180	28	12.14	5.54	0.9	0.5	0.8	0.4	Vertical	Nat. Conv.	340	155
DDP600-US28-UC	180-305	28	13.93	6.96	1	0.5	0.9	0.4	Vertical	Nat. Conv.	390	195
DDP600-US36-FF <sup>3</sup>	85-305	36	16.7 <sup>3</sup>	13.89	1	0,5	1.5	1	-	-	600 <sup>3</sup>	500
DDP600-US36-UC	85-180	36	16.7	11.11	1	0.5	1.2	0.8	-	600	600	400
DDP600-US36-UC	180-305	36	16.7	11.11	1	0.5	1.2	0.8	-	500	600	400
DDP600-US36-UC	85-180	36	8.61	3.47	1	0.5	0.8	0.5	Horizontal	Nat. Conv.	310	125
DDP600-US36-UC	180-305	36	9.72	4.59	1	0.5	1	0.5	Horizontal	Nat. Conv.	350	165
DDP600-US36-UC	85-180	36	9.44	4.31	0.9	0.5	0.8	0.4	Vertical	Nat. Conv.	340	155
DDP600-US36-UC	180-305	36	10.83	5.41	1	0.5	0.9	0.4	Vertical	Nat. Conv.	390	195
DDP600-US48-FF <sup>4</sup>	85-305	48	12.5 <sup>4</sup>	10.42	1	0,5	1.5	1	-	-	600 <sup>4</sup>	500
DDP600-US48-UC	85-180	48	12.5	8.33	1	0.5	1.2	0.8	-	600	600	400
DDP600-US48-UC	180-305	48	12.5	8.33	1	0.5	1.2	0.8	-	500	600	400
DDP600-US48-UC	85-180	48	6.46	2.60	1	0.5	0.8	0.5	Horizontal	Nat. Conv.	310	125
DDP600-US48-UC	180-305	48	7.29	3.44	1	0.5	1	0.5	Horizontal	Nat. Conv.	350	165
DDP600-US48-UC	85-180	48	7.08	3.23	0.9	0.5	0.8	0.4	Vertical	Nat. Conv.	340	155
DDP600-US48-UC	180-305	48	8.12	4.06	1	0.5	0.9	0.4	Vertical	Nat. Conv.	390	195

<sup>1</sup> **DDP600-US24-FF**: 25 A / 600 W up to 60 °C ambient

<sup>2</sup> **DDP600-US28-FF**: 21.4 A / 600 W up to 60 °C ambient

<sup>3</sup> **DDP600-US36-FF**: 16.7 A / 600 W up to 60 °C ambient

<sup>4</sup> **DDP600-US48-FF**: 12.5 A / 600 W up to 60 °C ambient

**MODEL CODING AND OUTPUT RATINGS 2/2**

<p>Nominal Output Power De-rating</p>	<p>Natural Convection U-Chassis Package Vertical Mounting 180 – 305 V<sub>AC</sub></p>	
<p>Peak Output Power De-rating</p>	<p>Forced Air Cooling U-Chassis Package</p> <p>&gt;500 LFM At 180 – 305 V<sub>AC</sub></p> <p>&gt;600 LFM At 85 – 180 V<sub>AC</sub></p>	
<p>Peak Output Power De-rating</p>	<p>Enclosed Front Mounted Fan 85 – 305 V<sub>AC</sub></p>	
<p>Peak Output Power De-rating</p>	<p>Natural Convection Any Orientation 85 – 305 V<sub>AC</sub></p>	

## INPUT SPECIFICATIONS

Specification	Test Conditions / Notes	Min.	Nominal	Max.	Units	
<b>AC Input Voltage</b>	PS starts and operates at 85 V <sub>AC</sub> at all load conditions	85	100-277	305	V <sub>RMS</sub>	
<b>DC Input Voltage</b>		170	-	300	V <sub>DC</sub>	
<b>Input Frequency</b>	440 Hz with reduced PFC and output power rating - Consult factory for details.	47	50/60	440	Hz	
<b>Input Current</b>	RMS at 180 V <sub>AC</sub> , maximum load, 50 / 60 Hz RMS at 85 V <sub>AC</sub> , maximum load, 50 / 60 Hz	-	-	4.0 8.5	A	
<b>Inrush Current (peak)</b>	Cold start, 25 °C ambient, full load					
	115 V <sub>AC</sub>	-	-	20	A	
	230 V <sub>AC</sub>	-	-	30	A	
<b>Fusing</b>	High breaking, 10A, 250V on each AC lines.	-	-	10	A	
<b>Efficiency</b>	At 115 V <sub>AC</sub> , 20% rated load 50% rated load 100% rated load	-	89 93 92	-	%	
	At 230 / 277 V <sub>AC</sub> , 20% rated load 50% rated load 100% rated load	-	90 94 94	-		
<b>Input Power Consumption</b>	Power on, 115 V <sub>AC</sub> , no load Power on, 230 V <sub>AC</sub> , no load Stand by, 115, 230 V <sub>AC</sub> , no load	-	-	5 4 0.35		W
<b>Power Factor</b>	From 50 to 100% of rated load, 230, 115 V <sub>AC</sub> , 50 / 60 Hz input voltages.	0.90	-	-		-
<b>THDi</b>	From 50 to 100% rated load, 115, 230, 277 V <sub>AC</sub> 50 / 60 Hz.	-	-	20		%
<b>Harmonic Current Fluctuations and Flicker</b>	Complies with EN 61000-3-2 at 230 V <sub>AC</sub> , 50/60 Hz, Class A, D. Complies with EN 61000-3-2 Class C at 230 V <sub>AC</sub> , 50/60 Hz, >150 W load. Complies with EN 61000-3-3 at nominal voltages and full load.					
<b>Earth Leakage Current</b>	Normal conditions 115 V <sub>RMS</sub> , 60 Hz 230 V <sub>RMS</sub> , 50 Hz 264 V <sub>RMS</sub> , 60 Hz (worst case) 277 V <sub>RMS</sub> , 60 Hz	-	130 240 -	- - 400	μA	
<b>Touch Leakage Current</b>	264 V <sub>RMS</sub> , 60 Hz Normal Condition (NC) Single Fault Condition (SFC)	-	-	100 500	μA	
<b>Patient Leakage Current</b>	264 V <sub>RMS</sub> , 60 Hz Normal Condition (NC) Single Fault Condition (SFC)	-	-	100 500	μA	

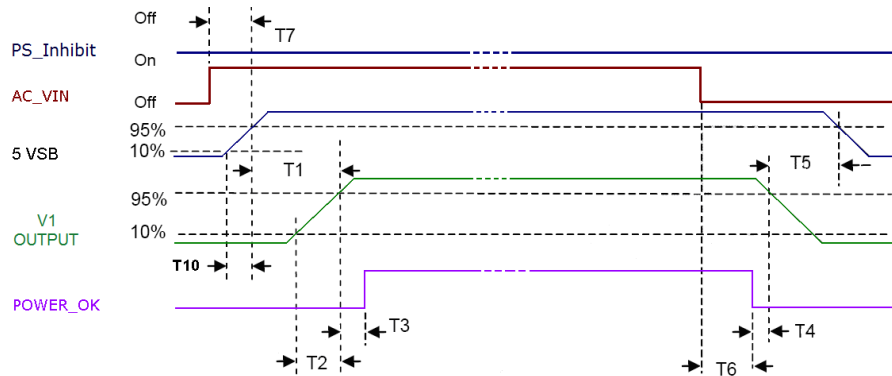
## OUTPUT SPECIFICATIONS

Specification	Test Conditions / Notes	Min.	Nom.	Max.	Units
<b>V1 Output Voltages</b>	±0.5% set point accuracy		24		
	RS+ closed on +V1, RS- closed on V1 RTN,		28		
	at 20% load.	-	36	-	V
			48		
<b>V1 Output Power Rating</b>	Convection cooling (see graph above)	-	-	400	
	Forced air cooling (see graph above)	-	-	600	W
	Peak (less than 10 s, after P_OK high)	-	-	800	
<b>V2 Output Voltage</b>	V1 at nominal voltage	10.5	12.25	14.00	V
<b>V2 Output Current</b>	Convection / forced air cooling	-	-	1	A
<b>5V<sub>SB</sub> Output Voltage</b>	±3% set point accuracy, 20% load.	-	5	-	V
<b>5V<sub>SB</sub> Output Current</b>	Front fan package	-	-	1.5	
	U chassis package	-	-	1.2	A
<b>V1 Voltage Adjustment Range</b>	Manually by potentiometer	-	-	±5	%V1
<b>V1 Load-Line-Cross Regulation</b>	V <sub>AC</sub> : 85 – 305 V <sub>RMS</sub> ; I <sub>1</sub> : 0 – 100%	-	-	±2	%V1
<b>5V<sub>SB</sub> Load-Line-Cross regulation</b>	V <sub>AC</sub> : 85 – 305 V <sub>RMS</sub> ; I <sub>5SB</sub> : 0 – 100%	-	-	±5	%5V <sub>SB</sub>
<b>V1 Line Regulation</b>	V <sub>AC</sub> : 85 – 305 V <sub>RMS</sub>	-	-	±0.1	%V1
<b>Transient Response: V1, 5V<sub>SB</sub> Voltage Deviation</b>	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				%V1
	36V at 680 μF load / I <sub>OUT</sub> > 1.9 A	-	-	±5	%5V <sub>SB</sub>
	48V at 560 μF load / I <sub>OUT</sub> > 1.25 A				
<b>V1 Ripple and Noise</b>	5V <sub>SB</sub> at 560 μF load / I <sub>OUT</sub> > 0.1 A Rated load, Peak-to-peak, 20 MHz BW. (100 nF ceramic, 10 μF tantalum at load)	-	-	1	%V1
<b>V1 Start-up Rise Time</b>	85<V <sub>IN</sub> <305, any load conditions.	10	-	100	ms
<b>Start-up Delay</b>	V1 in regulation after de-asserting PS_Inhibit	-	-	450	
	V1 in regulation after AC is applied (worst case: 85 V <sub>AC</sub> )	-	-	2050	ms
	5V <sub>SB</sub> in regulation after AC is applied (worst case: 85 V <sub>AC</sub> )	-	-	1500	
<b>Turn-on Overshoot</b>		-	-	10	%V1
		-	-	10	%V <sub>SB</sub>
<b>V1 Hold-up Time</b>	At nominal V <sub>IN</sub> , full load	16	-	-	ms
<b>Minimum Load</b>	V1, V2 and 5V <sub>SB</sub>	0	-	-	A
<b>Maximum Load Capacitance</b>	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	
<b>V1 Current Sharing Accuracy</b>	Two units in parallel at I1 rated load. VS-Logic and I-Share signals connected together. RS+, RS- signals connected together and to the load.	45.5	-	54.5	%I1

**SIGNALS / CONTROLS AND TIMING**

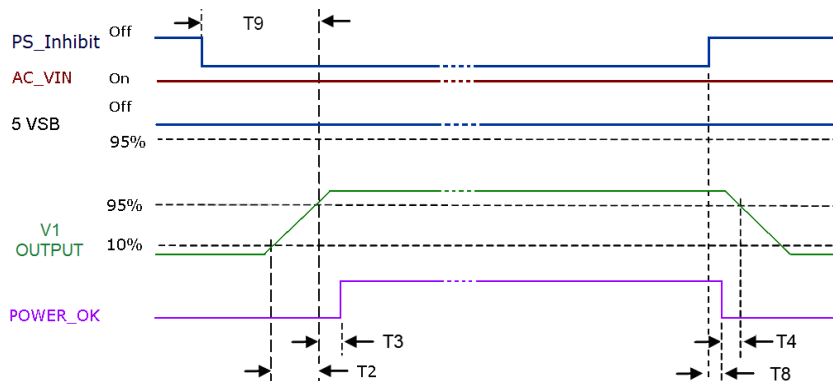
Signal	Notes	Min	Typ.	Max	Unit
<b>+PS_Inhibit</b>	Active high. Input low voltage	0	-	1.5	V
	Input high voltage ( $I_{IN}= 300 \mu A$ )	3.5	-	5.5	V
	V1 and V2 disabled when PS_Inhibit is pulled high				
	5V <sub>SB</sub> not affected by PS_Inhibit				
<b>-PS_Inhibit</b>	V1 and V2 enabled when PS_Inhibit is open or low				
	Active low (reverse control, same voltage levels)				
<b>P_OK<sup>5</sup></b>	Logic level low (<10 mA sinking)	-	-	0.7	V
	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
<b>5V<sub>SB</sub> Output</b>	Active and in regulation after a $85 < V_{AC} < 305$ is applied	-	-	1500	ms
	5V <sub>SB</sub> not affected by PS_Inhibit				

<sup>5</sup> When V1 is On, a P\_OK low may indicates V1 under voltage condition. When two DDP600 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, hiccup mode.	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) V1: Hiccup mode, auto-recovering (<10 s) V2: PTC limiting, auto-recovering. 5V <sub>SB</sub> : Hiccup mode, auto-recovering:	108 135 -	- - -	132 163 -	%I <sub>Rated</sub> %I <sub>Rated</sub>
	UC package	1.3	-	3.6	A
	FF package	1.6	-	3.6	A
Short Circuit	At nominal input voltages V1: Hiccup mode, auto-recovering. V2: PTC limiting, auto-recovering. 5V <sub>SB</sub> : Hiccup mode, auto-recovering.	-	-	-	
Over Voltage	V1, Power shut down, latch off. 5V <sub>SB</sub> , Hiccup mode, auto-recovering.	120 -	- -	145 150	%V <sub>NOM</sub>
Over Temperature (on primary stage)	Shut down, latch off.	-	-	-	°C
Over Temperature (on secondary side)	Hiccup mode, auto-recovering.	-	-	-	°C
Isolation: Input-to-Output	Reinforced (2x MoPP).	5660 4000	- -	- -	V <sub>DC</sub> V <sub>AC</sub>
	Production tested at 4242 V <sub>DC</sub>				
Isolation: Input-to-Earth	Basic (1x MoPP)	2121 1500	- -	- -	V <sub>DC</sub> V <sub>AC</sub>
	Production tested at 2121 V <sub>DC</sub>				
Isolation: V1/5V <sub>SB</sub> to V2	Basic	100	-	-	V <sub>AC</sub>
Isolation: Output-to-Earth	Basic (1x MoPP)	1500	-	-	V <sub>AC</sub>
Means Of Protection:	2x MoPP (IEC 60601-1 3 <sup>rd</sup> edition) at 100 – 250 V <sub>AC</sub> , 50/60 Hz up to 4000 m 2x MoPP (IEC 60601-1 3 <sup>rd</sup> edition) at 100 – 277 V <sub>AC</sub> , 50/60 Hz up to 3000 m				
Primary to secondary	2x MoOP (IEC 60601-1 3 <sup>rd</sup> edition) at 100 – 277 V <sub>AC</sub> , 440 Hz (50/60 Hz)				
Means Of Protection:	1x MoPP (IEC 60601-1 3 <sup>rd</sup> edition) at 100 – 250 V <sub>AC</sub> , 50/60 Hz up to 4000 m 1x MoPP (IEC 60601-1 3 <sup>rd</sup> edition) at 100 – 277 V <sub>AC</sub> , 50/60 Hz up to 3000 m				
Primary to Protection Earth	1x MoOP (IEC 60601-1 3 <sup>rd</sup> edition) at 100 – 277 V <sub>AC</sub> , 440 Hz (50/60 Hz)				
Means Of Protection:	1x MoPP (IEC 60601-1 3 <sup>rd</sup> edition) at 100 – 250 V <sub>AC</sub> , 50/60 Hz up to 4000 m 1x MoPP (IEC 60601-1 3 <sup>rd</sup> edition) at 100 – 277 V <sub>AC</sub> , 50/60 Hz up to 3000 m (U-chassis variant only)				
Secondary to Protection Earth	1x MoOP (IEC 60601-1 3 <sup>rd</sup> edition) at 100 – 277 V <sub>AC</sub> , 440 Hz (U-chassis variant only)				
Equipment Protection Class	Class I, compatible with BF (Body Floating) ME				

## ENVIRONMENTAL SPECIFICATIONS

Specification	Test Conditions / Notes	Min	Nominal	Max	Units
Operating Temperature Range	No de-rating up to 50°C	-20	-	50	°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	MoPP (100 – 250 V <sub>AC</sub> , 50/60 Hz)	-	-	4000	
	MoPP (100 – 277 V <sub>AC</sub> , 50/60 Hz)	-	-	3000	m
	MoOP, ITE grade	-	-	5000	
	Power de-rating above 1800 m				
Shock	<b>EN 60068-2-27</b> 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	<b>EN 60068-2-64</b> 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	300.000	-	-	Hours
	80% Duty cycle, Telcordia SR-332 Issue 2				
Useful Life	Worst nominal V <sub>IN</sub> , 80% load, 40 °C ambient.	-	4	-	Years

## ELECTROMAGNETIC COMPATIBILITY (EMC) – EMISSIONS

Phenomenon	Conditions / Notes	Standard	Equipment/Performance Class
<b>Conducted</b>	115, 230, 277 V <sub>RMS</sub> . Maximum load.	EN 55032 (ITE) EN 55011 (ISM) EN 60601-1-2 (Medical) FCC Part 15	B
<b>Radiated</b>	At 10 m distance	EN 55032 (ITE) EN 55011 (ISM) EN 60601-1-2 (Medical) FCC Part 15	B <sup>6</sup>
<b>Line Voltage Fluctuation and Flicker</b>	At 20%, 50% and 100% maximum load. Nominal input voltages	EN 61000-3-3	
<b>Harmonic Current Emission</b>	230 V <sub>AC</sub> input voltage, 50 / 60 Hz 230 V <sub>AC</sub> 50 / 60 Hz, >150 W load	EN 61000-3-2 EN 61000-3-2	A, D C

<sup>6</sup> Performance referred to the enclosed package. Radiated emission relevant to the U-Chassis package variant, should be assessed at system level.

## ELECTROMAGNETIC COMPATIBILITY (EMC) – IMMUNITY

Phenomenon	Conditions / Notes	Standard	Test Level	Criteria
	<b>Reference standard for the medical version</b>	<b>EN 60601-1-2, 4<sup>th</sup> edition</b>		
	<b>Reference standards for ITE</b>	<b>EN 55024</b>		
	<b>Reference standard for Industrial/IMS equipment</b>	<b>EN 61000-6-2</b>		
<b>ESD</b>	15 kV air discharge, 8 kV contact, at any point of the system.	EN 61000-4-2	4	A
<b>Radiated Field</b>	10 V/m, 80-1000 MHz, 1 KHz/2 Hz 80% AM. Dwell time is 3 sec for 2 Hz modulation Dwell time is 1 sec for 1KHz modulation	EN 61000-4-3	3	A
<b>Electric Fast Transient Surge</b>	±2 kV on AC power port for 1 minute ±2 kV line to line; ± 4 kV line to earth on AC power port	EN 61000-4-4 EN 61000-4-5	3 4	A A
<b>Conducted RF Immunity</b>	10 V <sub>RMS</sub> , 0,15-80 MHz, 1 kHz/2 Hz 80% AM	EN 61000-4-6	3	A
<b>Dips and Interruptions</b>	<b>200 – 277 V<sub>AC</sub>:</b> Drop-out to 0% for 10 ms Dip to 40% for 5 cycles (100 ms) Dip to 70% for 25 cycles (500 ms) Drop-out to 0% for 5 s	EN61000-4-11 EN61000-4-11 EN61000-4-11 EN61000-4-11		A A A B
	<b>100 – 127 V<sub>AC</sub>:</b> Drop-out to 0% for 10 ms Dip to 40% for 5 cycles (100 ms) Dip to 70% for 25 cycles (500 ms) Drop-out to 0% for 5 s	EN 61000-4-11 EN 61000-4-11 EN 61000-4-11 EN 61000-4-11		A A (de-rate to 150 W) A (de-rate to 400 W) B

## SAFETY AGENCIES APPROVALS

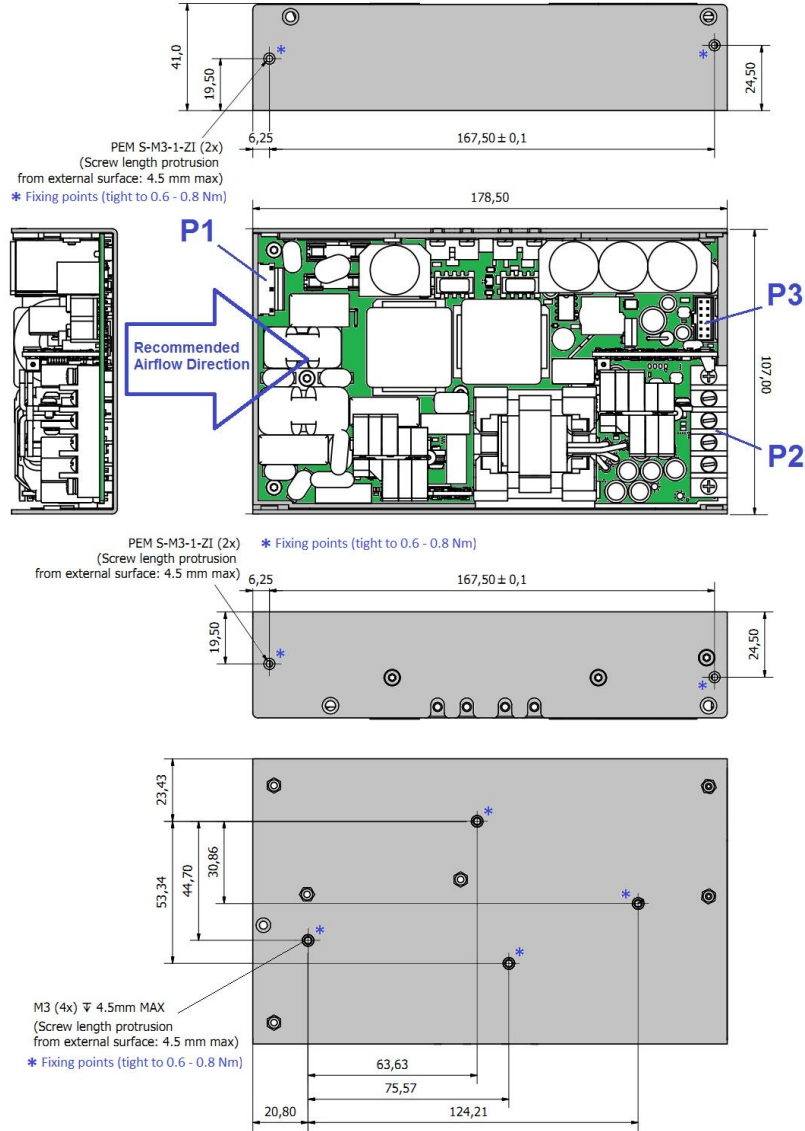
Certification Body	Safety Standards and file numbers	Category
<b>CSA/UL</b>	CSA C22.2 No. 60950-1, UL 60950-1 and UL 62368-1	Audio Video and Information Technology Equipment
	CSA C22.2 No.60601-1, ANSI/AAMI ES60601-1 3 <sup>rd</sup> edition + A1 Including Risk Management Assessment	Medical
	UL8750, CSA C22.2 No 250.13	Lighting
<b>IEC IECEE CB Certification</b>	IEC/EN 60950-1 and IEC/EN 62368-1	Audio Video and Information Technology Equipment
	IEC/EN 60601-1 3 <sup>rd</sup> edition+A1 Including Risk Management Assessment	Medical
<b>CE</b>	Directive 2014/35/EU: Electrical Safety: Low Voltage electrical equipment (LVD)	Audio Video and Information Technology Equipment
	Directive 93/42/CEE: Safety Requirement of the Medical Device	Medical
	Directive 2014/30/EU: Electromagnetic Compatibility (EMC)	
	Directive EU 2015/863: RoHS 3	
Designed to meet IEC/EN/UL/CSA 61010-1 2 <sup>nd</sup> edition		



## OUTLINE DRAWING AND CONNECTIONS – U-CHASSIS FRAME (-UC)

Overall dimensions: 107.0 x 178.5 x 41.0 mm (4.21 x 7.03 x 1.61 in)

Weight: 820 g (1.8 lb)



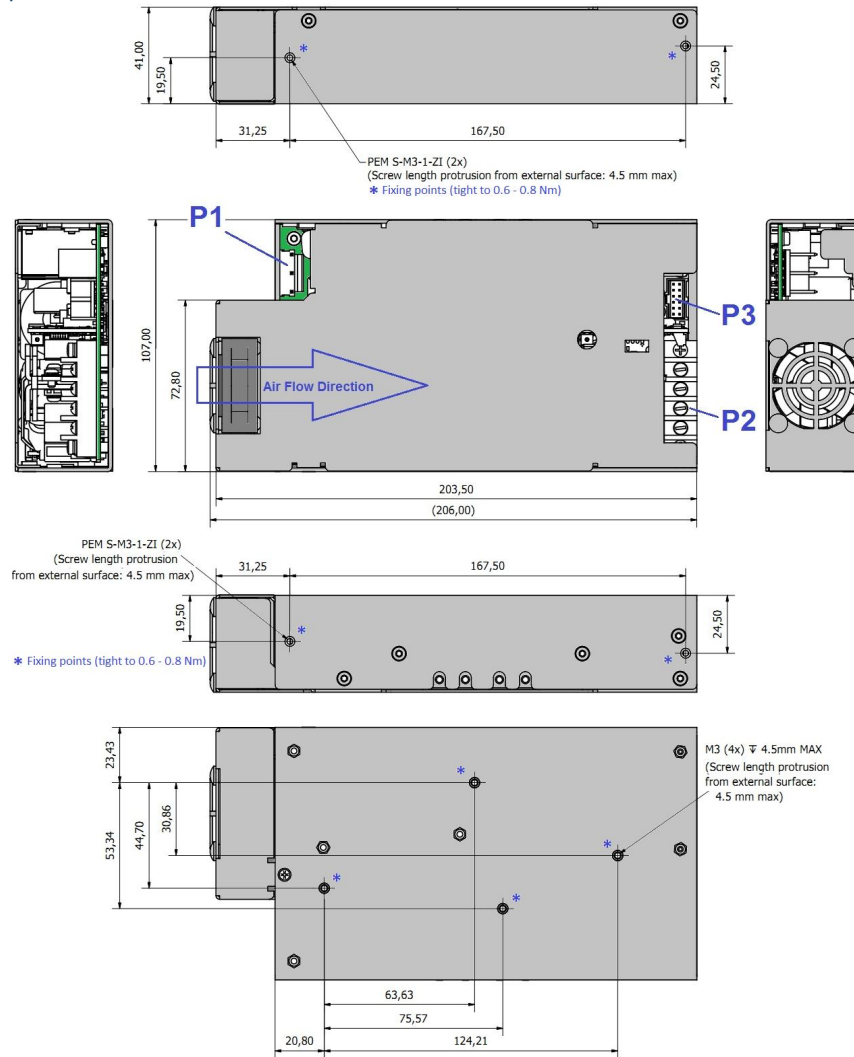
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Molex 90130-1112 Mates with Molex 90142-0012 (housing) Molex 90119-0109 (terminal) Use 22-24 AWG wires	<table border="1"> <thead> <tr> <th>Pin Ref.</th> <th>Function</th> </tr> </thead> <tbody> <tr><td>1</td><td>RTN</td></tr> <tr><td>2</td><td>-V2</td></tr> <tr><td>3</td><td>+5V<sub>SB</sub></td></tr> <tr><td>4</td><td>+V2</td></tr> <tr><td>5</td><td>RS<sup>-</sup></td></tr> <tr><td>6</td><td>RS<sup>+</sup></td></tr> <tr><td>7</td><td>+PS_Inhibit</td></tr> <tr><td>8</td><td>I-Share</td></tr> <tr><td>9</td><td>P_OK</td></tr> <tr><td>10</td><td>VS_Logic</td></tr> <tr><td>11</td><td>-PS_Inhibit</td></tr> <tr><td>12</td><td>RTN</td></tr> </tbody> </table>	Pin Ref.	Function	1	RTN	2	-V2	3	+5V <sub>SB</sub>	4	+V2	5	RS <sup>-</sup>	6	RS <sup>+</sup>	7	+PS_Inhibit	8	I-Share	9	P_OK	10	VS_Logic	11	-PS_Inhibit	12	RTN
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## OUTLINE DRAWING AND CONNECTIONS – ENCLOSED FRONT FAN (-FF)

Overall dimensions: 107.0 x 206.0 x 41.0 mm (4.21 x 8.11 x 1.61 in)

Weight: 1055 g (2.32 lb)



Signals Connector – P3		
	Pin Ref.	Function
<p><b>Molex 90130-1112</b> Mates with Molex 90142-0012 (<i>housing</i>) Molex 90119-0109 (<i>terminal</i>) Use 22-24 AWG wires</p>	1	RTN
	2	-V2
	3	+5V <sub>SB</sub>
	4	+V2
	5	RS <sup>-</sup>
	6	RS <sup>+</sup>
	7	+PS_Inhibit
	8	I-Share
	9	P_OK
	10	VS_Logic
	11	-PS_Inhibit
	12	RTN

AC Input Connector – P1		
	Pin ref.	Function
<p><b>Molex 26-62-4051</b> Mates with Molex 09-93-0500 (<i>housing</i>) Molex 08-52-0071 (<i>terminal phosphor bronze, tin finishing</i>) Use 18 AWG minimum wires</p>	1	L1
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DC Output Connector – P2		
	Pin Ref.	Function
<p><b>KARSON 520-041-2-1-00</b> or equivalent (tight to 0.8-1.0 Nm)</p>	1 – 2	+V1
	3 – 4	V1 RTN

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