ITE AND SSL APPROVED, 1200 W AC-DC COMPACT, EFFICIENT, POWER SUPPLY

DDP1200 (FF, UCF, PCF) SERIES

MAIN FEATURES

- Universal input voltage range (85 – 305 V_{AC})
- Input inrush current limiting
- 1200 W rated power
- High efficiency up to 94%
- Single 24 or 48 V_{DC} output voltage available
- Active PFC, EN61000-3-2 compliant (Class C, >25% load)
- Low earth / touch leakage current
- Fan speed control function
- Over temperature, OV, OC and SC protections
- +12 V, 0.5 A; +5 V, 1 A Stand by outputs
- Built-in current sharing and OR-ing for parallel operation and N+1 redundancy
- Remote On / Off signal
- Power good and remote sense signals
- All packages fit 1U applications
- ITE safety approval to IEC 62368-1, IEC 60950-1 and LED lighting approval to UL 8750
- RoHS 3 compliant (Directive 2015/863/UE)
- 5000 m altitude operation
- PMBus™ digital power-management protocol supported

5 YEAR WARRANTY

EFFICIENCY

DESCRIPTION

Rated for IT / Industrial and LED lighting, the DDP1200 series of AC-DC power supplies offer increased embedded power in multiple 1U compatible packages, high energy efficiency and wide versatility.

The series provides a steady 1200 W of regulated DC power through 180-305 V_{AC} and 1000 W through 85-137 V_{AC} input voltage ranges in a single output of 24 or 48 V_{DC}.

The DDP1200 series is available in three (3) compact 1U height compatible packages; one, enclosed with a built-in front mounted pair of fans and two (available only 24V variant), U-shaped chassis with or without protective cover, to facilitate system integration.

By converting AC power at a 94% typical efficiency rate, the DDP1200 series generates very little heat allowing for optimal thermal management.

The series offers a 12 V_{DC}, 0.5 A and a 5 V_{DC}, 1 A stand-by output and the full set of protection features including 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 DDP1200 series supports digital power management over the PMBus™ communications protocol enabling interoperation with and easy integration into a system. In addition, analogue control signals include Power Good (P_OK), Remote On / Off (+/-PS_Inhibit) and Sense terminals (RS^+, RS^-).

Multiple DDP1200 units may be used in parallel mode for redundancy and / or higher power, made possible with the internal OR-ing and current sharing functions.

The dual front-mounted fan version provides the full output rated power up to 60 °C. Its fan rotation speed is digitally controlled to guarantee the minimum required airflow, minimizing audible noise for quiet operation, and enhancing the power supply service life time. Rated power is also achieved in the U-chassis variants, with or without protecting cover, when providing them with an 800 LFM airflow from top side up to 55 °C. All variants can be operated up to 70 °C de-rating the output power.

The DDP1200 series complies with the latest IEC/EN/UL 62368-1, 60950-1 safety standards for Audio Video and Information Technologies and with the UL8750 safety standard for LED Lighting.

The DDP1200 series meets the EN 55032 EMC limits of Class B for conducted and radiated emissions, the EN 61000-3 for flicker and harmonics content and the EN 55024, EN 61000-6-2 for EM immunity.

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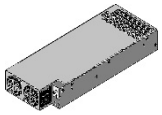
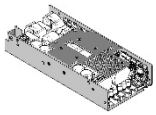
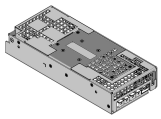
DDP1200 (FF, UCF, PCF) SERIES

MARKET SEGMENTS AND APPLICATIONS

- Video Wall Display, Entertainment Lighting
- LED Lighting Engine
- Industrial Control Systems
- Industrial Laser Applications

MODEL CODING AND OUTPUT RATINGS

Model Grade, Output Power	Output Voltages	Packages and Cooling	
IT/Industrial Grade: **DDP1200**	*24 VDC:* **-US24-** *48 VDC:* **-US48-**	 *Front Mounted Fans:* **-FF**	 *U-Chassis External Forced Air Cooling:* **-UCF** (only available for the 24V variant)
			 *Perforated Cover External Forced Air Cooling:* **-PCF** (only available for the 24V variant)

Output Parameter	24V		48V	
	180-305V_{AC} 163-300V_{DC}	85-137V_{AC} 120-163V_{DC}	180-305V_{AC} 163-300V_{DC}	85-137V_{AC} 120-163V_{DC}
V1 Nom Voltage	24 V_{DC}		48 V_{DC}	
V1 Adjust Range	±5% V_{NOM}			
V1 Rated Power	1200 W	1000 W	1200 W	1000 W
V1 Rated Current	50 A	41.7 A	25 A	20.8 A
V1 Line Regulation	±0.1%			
V1 Load Line Cross Regulation	±2%			
V1 Ripple & Noise	1% Peak-to-peak			
V1 Transient response	±5%V1 to 25% load change at 1 A/µs			
V1 Over Current Protection	<75 A		<37.5 A	
V1 Over Voltage protection	116% V_{NOM} < V_{OUT} < 145% V_{NOM}			
V1 Max Out Capacitance	16000 µF		8000 µF	
$12V_{SB}$ Nominal Voltage	12 V_{DC} (stand-by output voltage is referred to the same V1 output voltage return)			
$12V_{SB}$ Rated Current	0.5 A (maximum +12 V_{SB} and +5 V_{SB} combined output power is 6 W)			
$12V_{SB}$ Ripple & Noise	120 mV Peak-to-peak			
$12V_{SB}$ Line Cross Regulation	±5%			
$5V_{SB}$ Nominal Voltage	5 V_{DC} (stand-by output voltage is referred to the same V1 output voltage return)			
$5V_{SB}$ Rated Current	1 A (maximum +12 V_{SB} and +5 V_{SB} combined output power is 6 W)			
$5V_{SB}$ Ripple & Noise	50 mV Peak-to-peak			
$5V_{SB}$ Load, line cross Regulation	±5%			

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INPUT SPECIFICATIONS

Specification	Test Conditions / Notes	Min.	Nominal	Max.	Units
AC Input Voltage	PS starts at 85 V_{AC} at all load conditions Operating input voltage range DDP1200 is designed to operate with a square or trapezoidal input voltage wave form (i.e. from UPS)	85	100-277	305	V_{RMS}
DC Input Voltage	Built in fuses has been safety certified up to 250V_{DC}. Operating the DDP1200 above that limit up to 300 V_{DC}, does require an external fuse protection (*)	120	-	300	V_{DC}
Input Frequency	400 Hz (max 440 Hz) operation over 85 – 137 V_{AC} input range	47	50/60	63	Hz
Input Current	At 180 V_{AC}, maximum load, 50 / 60 Hz At 85 V_{AC}, 1000 W load, 50 / 60 Hz 163 V_{DC}, maximum load 120 V_{DC}, 1000 W	- -	- -	8.0 14.5 9.0 10.0	A_{RMS} A
Inrush Current	At power-on asserted Cold start, 25 °C ambient, full load Any point of the AC input sine 230 V_{AC} 277 V_{AC}	- -	- -	30 50	A
Fusing	High breaking, 16 / 20 A, 277 V_{AC} (250 V_{DC}) on each AC lines.	-	-	16 / 20	A
Efficiency	**24, 48V variants:** At 120 V_{AC}, 20% rated load 50% rated load 100% rated load At 230 V_{AC}, 20% rated load 50% rated load 100% rated load	88 92 92 90 93 94	- - - - - -	- - - - - -	%
Input Power Consumption	At power on, no load, 100-277 V_{AC} range, FF At power on, no load, 100-277 V_{AC} range UCF/PCF Stand by, no load, nominal 100-277 V_{AC} range	- - -	7.0 6 4.0	- - -	W
Power Factor	Any nominal input line voltage, 50/60 Hz, from 50 to 100% maximum load	0.95	-	-	-
THDi	From 50 to 100% rated load, 100-277 V_{AC},50/60 Hz.	-	-	20	%
Harmonic Current Fluctuations and Flicker	Complies with EN 61000-3-2 at 230 V_{AC}, 50/60 Hz, Class A, D. Complies with EN 61000-3-2 Class C at 230 V_{AC}, 50/60 Hz, >300 W load. Complies with EN 61000-3-3 at nominal voltages and full load.				
Earth Leakage Current	Normal conditions 115 V_{RMS}, 60 Hz 230 V_{RMS}, 50 Hz 264 V_{RMS}, 60 Hz (worst case)	- - -	130 240 -	- - 400	µA
Touch Leakage Current	264 V_{RMS}, 60 Hz Normal Condition (NC) Single Fault Condition (SFC)	- -	- -	100 500	µA

(*) Suggested fuse SIBA 5012434.16 and fuse holder SIBA 5105805.1

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OUTPUT SPECIFICATIONS

Specification	Test Conditions / Notes	Min.	Nom.	Max.	Units
V1 Output Voltages	±0.5% set point accuracy RS+ closed on +V1, RS- closed on V1 RTN, at 6% load.	-	24 48	-	V
V1 Output Power Rating	FF variant at 180 – 305 V_{AC} UCF, PCF variants at 180-305 V_{AC}, 800 LFM FF variant at 85 – 137 V_{AC} UCF, PCF variants at 85 – 137 V_{AC}, 800 LFM			1200 1200 1000 1000	W
$12V_{SB}$ Output Voltage		-	12	-	V
$12V_{SB}$ Output Current	FF, UCF and PCF packages up to 70 °C	-	-	0.5	A
$5V_{SB}$ Output Voltage		-	5	-	V
$5V_{SB}$ Output Current	FF, UCF and PCF packages up to 70 °C	-	-	1	A
V1 Voltage Adjustment Range	Manually by push up and down buttons	-	-	±5	%V1
V1 Load-Line-Cross Regulation	V_{AC}: 85 – 305 V_{RMS}; I1: 0 – 100%	-	-	±2	%V1
$5V_{SB}$, $12V_{SB}$ Load-Line-Cross regulation	V_{AC}: 85 – 305 V_{RMS}; I_{SB}: 0 – 100%	-	-	±5	$\%V_{SB}$
V1 Line Regulation	V_{AC}: 85 – 305 V_{RMS}	-	-	±0.1	%V1
Transient Response: V1, $12V_{SB}$, $5V_{SB}$ Voltage Deviation	25% load changes at 1 A/µs 24V at 1000 µF load / I_{OUT}> 2.5 A 48V at 560 µF load / I_{OUT}> 1.25 A $12V_{SB}$, $5V_{SB}$ at 0-2200 µF load	-	-	±5	%V1 $\%V_{SB}$
V1 Ripple and Noise	Rated load, Peak-to-peak, 20 MHz BW. (100 nF ceramic, 10 µF tantalum at load)	-	-	1	%V1
V1 Start-up Rise Time	85<V_{IN}<305, any load conditions.	10	-	150	ms
Start-up Delay	V1 in regulation after de-asserting PS_Inhibit V1 in regulation after AC is applied (worst case: 85 V_{AC}) $5V_{SB}$ in regulation after AC is applied (worst case: 85 V_{AC})	- - -	- - -	1700 2200 500	ms
Turn-on Overshoot		- -	- -	10 10	%V1 $\%V_{SB}$
V1 Hold-up Time	At nominal V_{IN}, full load SEMI F47-0706 compliant at ≥208 V_{AC} 50% sag (104 V) 30% sag (145 V) 20% sag (166 V)	10 200 500 1000	- - - -	- - - -	ms
Minimum Load	V1, $12V_{SB}$, $5V_{SB}$	0	-	-	A
Maximum Load Capacitance	V1: 24 V_{DC} V1: 48 V_{DC}	- -	- -	16000 8000	µF
V1 Current Sharing Accuracy	Parallel operation up to four units. Two units in parallel at I1 rated load. I-Share signals connected together. RS^+, RS^- signals connected together and to the load. Max load at start up 1200 W, operating 2000 W, 180 ÷305 V_{AC}. Max load at start up 1000 W, operating 1667 W, 85 ÷ 137 V_{AC}. (referred to -FF, -PCF and -UCF)	40	-	60	%I1
V1 Remote Sense	RS^+ and RS^- power path voltage loss compensation	-	-	0.36	V

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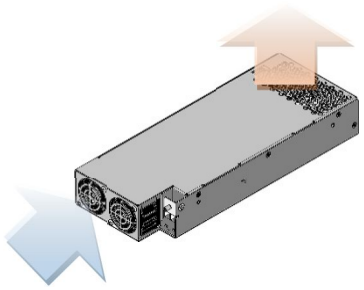
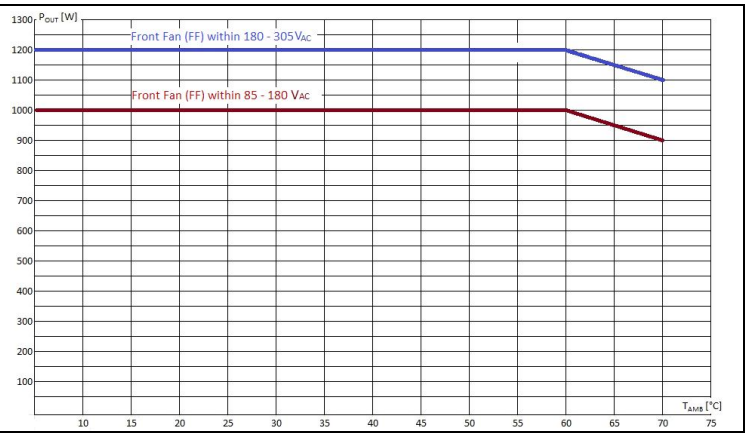
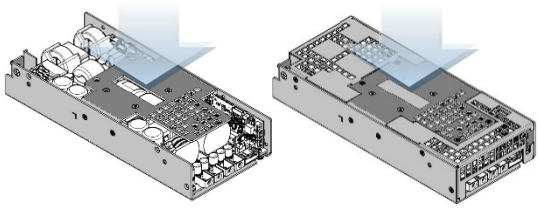
OUTPUT POWER DE-RATING CURVES

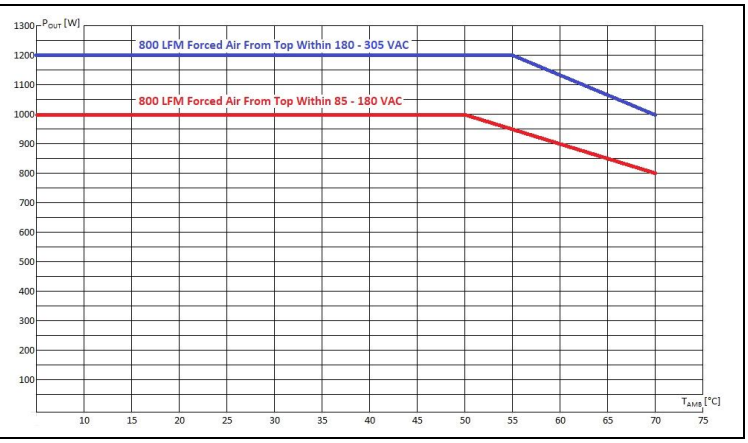
Front Fan (FF); 24, 48 V
Any orientation, V1 nominal



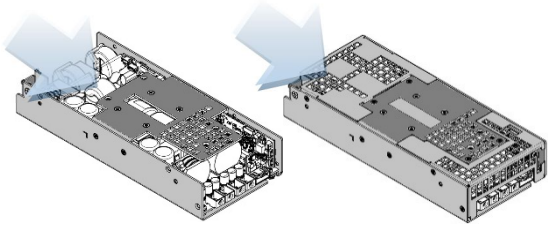


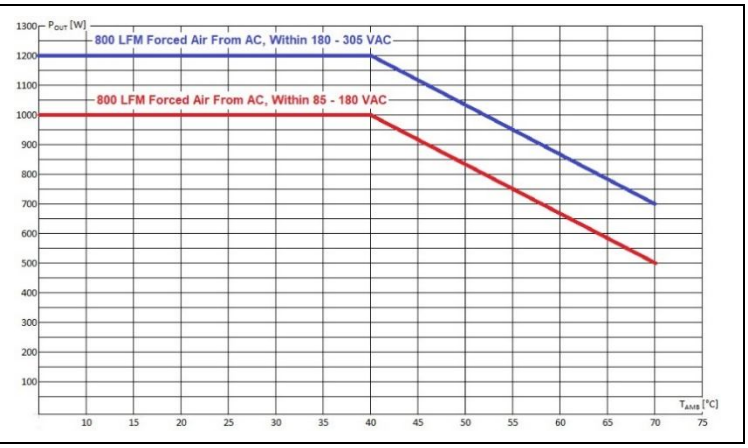
U-Chassis and Perforated Cover
Forced Air Cooling (UCF, PCF); 24 V
Air flow from top, V1 nominal





U-Chassis and Perforated Cover
Forced Air Cooling (UCF, PCF); 24 V
Air flow from AC side, V1 nominal





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PMBUS

The DDP1200 does support communication according to the PMBus 1.2 protocol via SDA, SCL and #SMBALERT signals as defined in the SMBus Specification version 2.0.
The power supply shall not load the SMBus if it has no input power (SCL & SDA lines should go to High-Z).
The pull-up resistors (2.2 kΩ) for these signals shall be external to the power supply and referenced to an external +3.3V bus voltage.
The DSP circuits inside the power supply are powered by the standby output.
The PMBus is active whatever input power is applied to the power supply or a parallel redundant power supply in the system, provided that their $12V_{SB}$ are connected in parallel.
Maximum speed of SMBus is 100 kHz.
The ADDR0 and ADDR1 signals, are inputs to the power supply that control the PMBus address assigned to the power supply.
On the system side, the ADDR0 and ADDR1 signals will either be connected to return through a 1 kΩ pull-down resistor or connected to +3.3V external bus voltage through a 1 kΩ pull-up resistor.
The address shall be derived from the logic of this pin as indicated on Outline Drawing and Connections section.
The power supply is a slave only on SMBus device.

For a comprehensive description of DDP1200 PMBus management, do refer to the application note, “AN_MDP-DDP1200 PMBus Mgt_Rev00”. Examples of DDP1200 parameters available through communication bus are:

- Input voltage status
- Output voltages +V1 measured value
- Output current on +V1 measured value
- Current sharing status
- Thermal health measured value
- Fan health status
- Power-On / Working hours
- Product information
- Status information

Failures shall be reported by PMBus for all failure types:

- Fan fault
- Protections failure (OV, OC, OT)
- Voltages out of specification.

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BASE SIGNALS / CONTROLS (ACCESSIBLE FROM SIGNAL CONNECTOR P204)

Signal	Notes	Min	Typ.	Max	Unit
+PS_Inhibit (Active High)	Input low voltage (I_{IN}= 0 µA) Input high voltage (I_{IN}= 500 µA at 5.5 V) V1 disabled when PS_Inhibit is pulled high V1 enabled when PS_Inhibit is floating or low $5V_{SB}$ and $12V_{SB}$ not affected by PS_Inhibit	0 2.5	- -	0.8 5.5	V
-PS_Inhibit (Active Low)	Input low voltage (I_{IN}= -800 µA at 0 V) Input high voltage (I_{IN}= -200 µA at 2.5 V) (I_{IN}= 700 µA at 5.5 V) V1 disabled when -PS_Inhibit is pulled low V1 enabled when -PS_Inhibit is floating or high $5V_{SB}$ and $12V_{SB}$ not affected by -PS_Inhibit	0 2.5	- -	0.8 5.5	V
Power_OK (*) (PS_OK)	Logic level low (<10 mA sinking) Logic level high (200 µA sourcing) Low to high time after V1 in regulation Power down warning time	- 2.4 150 2	- - - -	0.7 3.45 350 -	V ms
I_Share	The I_SHARE signals shall be daisy chained among power supplies operating in parallel. On a single power supply operating it provides current measurement on V1 output. On multiple power supplies operating in parallel, it provides current measurement on master V1output.				
SDA, SCL, #SMBALERT, ADDR0, ADDR1	These are signals which support PMBus communication protocol as specified in the application note AN_MDP-DDP1200 PMBus Mgt_Rev00.				
RSVD RX, RSVD TX	Mainly intended for internal ENEDO use, these RX and TX signals - available at the output signal connector P204 - may be used to access some DSP functions (monitoring, threshold settings, debug functions). These signals work as an UART Rx/Tx port and can also work as a RS-232 Rx/Tx port by building in the "RS-232 LINE DRIVERS/RECEIVERS" IC				
$5V_{SB}$ Output (**)	Active and in regulation after an 85<V_{AC}<305 is applied Not affected by PS_Inhibit. Available on P204, pin#4	-	-	500	ms
$12V_{SB}$ Output (***)	Active and in regulation after an 85<V_{AC}<305 is applied Not affected by PS_Inhibit. Available on P204, pin#16	-	-	500	ms

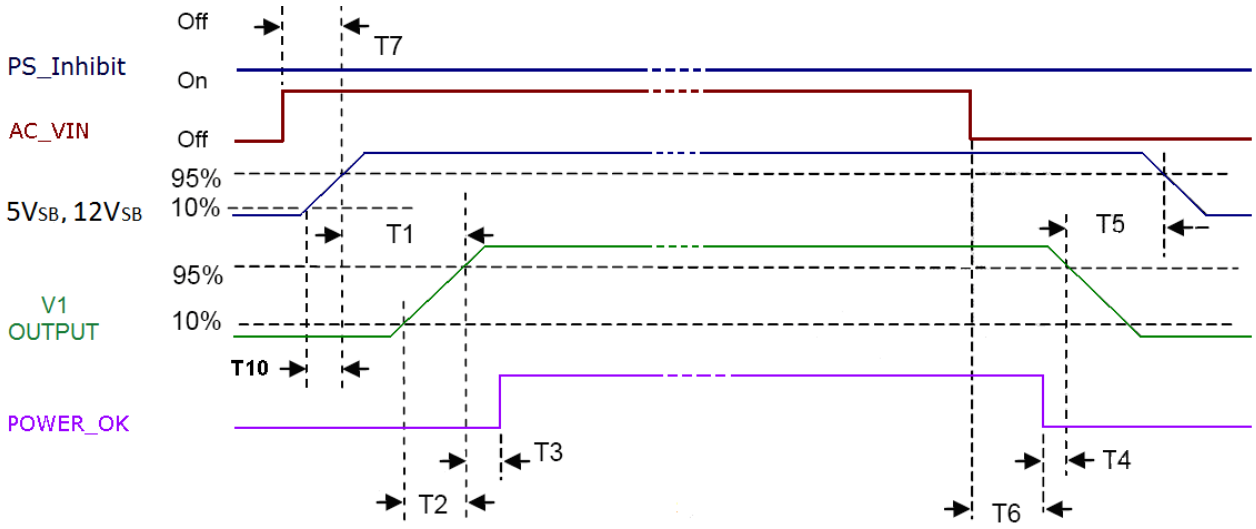
(*) When V1 is On, a P_OK low may indicates V1 under voltage condition. When two DDP1200 operate in parallel, P_OK low in one unit indicates that it is not sharing the expected amount of current (current sharing fault). A 3.3 kΩ internal pull up to a 3.3 V internal reference voltage is used; do not add any other external pull up.

(**) The $5V_{SB}$ outputs of two or more DDP1200s operating in parallel, cannot be connected in parallel in turn, since doing so results in power supplies damage.

(***) The $12V_{SB}$ outputs of two or more DDP1200s operating in parallel can be connected in parallel in turn, taking into account that the maximum available power will not be higher of a single operating power supply one.

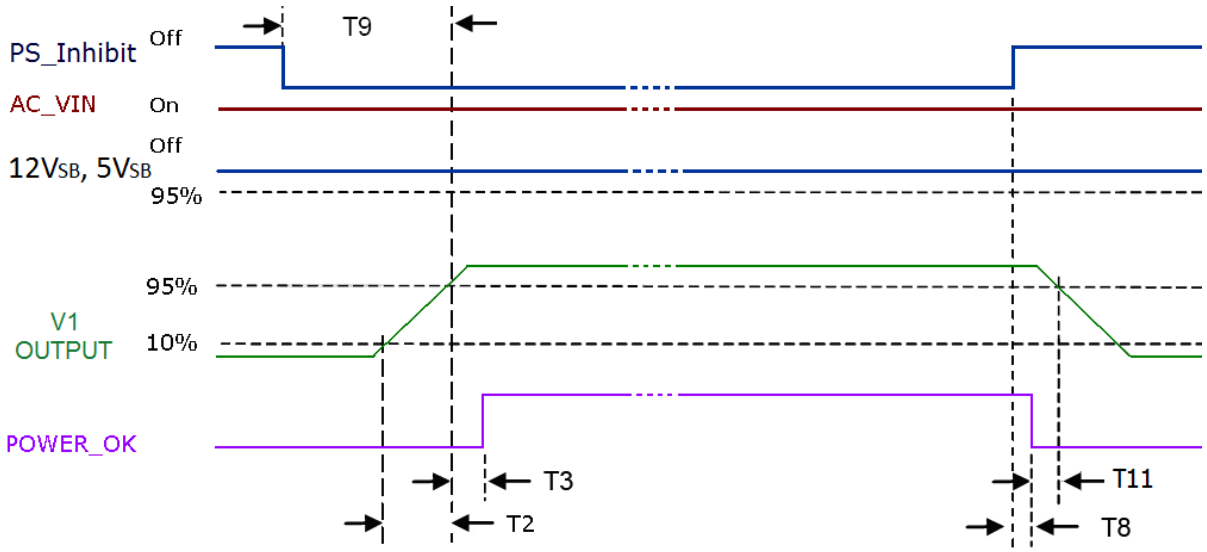
BASE SIGNALS / CONTROLS TIMING

AC/DC input Off-to-On and On-to-Off timings:



$12V_{SB}/5V_{SB}$ On to V1 On	250 ms ≤ T1 ≤ 1700 ms
V1 rise time	10 ms ≤ T2 ≤ 150 ms
$12V_{SB}/5V_{SB}$ rise time	3 ms ≤ T10 ≤ 150 ms
V1 On – POWER_OK delay	150 ms ≤ T3 ≤ 350 ms
Power down warning	T4 ≥ 2 ms
V1 Off to $12V_{SB}/5V_{SB}$ Off	T5 ≥ 0.5 s (V1 load > 25 W)
AC Off to POWER_OK low	T6 ≥ 8 ms
AC_On to $12V_{SB}/5V_{SB}$ On	T7 ≤ 500 ms

PS_Inhibit Off-to-On and On-to-Off timings:



V1 rise time	10 ms ≤ T2 ≤ 150 ms
V1 On – POWER_OK delay	150 ms ≤ T3 ≤ 350 ms
Turn-Off warning	T11≥1 ms
PS_Inhibit – POWER_OK low delay	T8 ≤ 3 ms
PS_Inhibit – V1 On delay	T9 ≤ 1700 ms

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PROTECTION FEATURES

Specification	Test Conditions / Notes	Min.	Nominal	Max.	Units
Input Under Voltage	Auto-recovering, hiccup mode.	58	75	82	V_{AC}
Input Fuse	High breaking, 16 / 20 A, 277 V_{AC} (250 V_{DC}) on each AC lines.	-	-	16/20	A
Over Current	At nominal input voltages V1: Hiccup mode, auto-recovering $5V_{SB}$: Auto-recovering $12V_{SB}$: Hiccup mode, auto-recovering See Output Ratings Table section	 - - -	 - - -	 150 - -	 $\%I1_{Rated}$ A A
Short Circuit	At nominal input voltages V1: Hiccup mode or latch $5V_{SB}$: Auto-recovering $12V_{SB}$: Hiccup mode, auto-recovering.	-	-	-	
Over Voltage	V1, Power shut down, latch off. $12V_{SB}$, Hiccup mode, auto-recovering.	116 -	- -	145 150	$\%V_{NOM}$
Over Temperature (ambient)	Hiccup mode, auto-recovering.	70	-	-	°C
Over Temperature (on secondary side)	Hiccup mode, auto-recovering.	-	-	-	°C
Fan Fault Protection	Relevant to the "-FF" variant. The DSP monitors the signals (frequency generator) provided by both fans. If one fan fails, the DSP asserts maximum speed the other fan and provides an alarm indication through PMBus. If both fans fail, the DSP provides an alarm indication through LED and PMBus and after 20 s, does shut down V1. PS INHIBIT or AC/DC input have to be cycled to resume operations, after removed the fault.				
Isolation: Primary-to-Secondary	Reinforced	5660 4000	- -	- -	V_{DC} V_{AC}
Isolation: Input-to-Earth	Basic Production tested at 2642 V_{DC}	2642 1865	- -	- -	V_{DC} V_{AC}
Isolation: Output-to-Earth	Basic	1500	-	-	V_{AC}
Equipment Protection Class		Class I			

ENVIRONMENTAL SPECIFICATIONS

Specification	Test Conditions / Notes	Min	Nominal	Max	Units
Operating Temperature Range	No de-rating up to 60 °C (FF) and up to 55 °C (UCF/PCF) See de-rating curves above DDP1200 starts at -40 °C upon warm up delay	-20	-	60	°C
Operating Temperature Range with De-rating	See de-rating curves and conditions in the Output Specifications section	-	-	70	°C
Storage Temperature **Transportation Temperature**	As per IEC/EN 60721-3-1 Class 1K4 As per IEC/EN 60721-3-2 Class 2K4	-40	-	85	°C
Humidity	RH, Non-condensing Operating. Non-operating	-	-	90 95	% %
Operating Altitude	Power de-rating above 1800 m	-	-	5.000	m
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^2/Hz, 1 g_{RMS}, 3 axes, 30 min. Non-Operating: 5 – 500 Hz, 2.46 g_{RMS} (0.0122 g^2/Hz), 3 axes, 30 min.				
MTBF	Full load, 25 °C ambient, 100% duty cycle, Full load, 40 °C ambient, 75% duty cycle Telcordia SR-332 Issue 2	700.000 600.000	- -	- -	Hours
Useful Life	Nominal V_{IN}, 80% load, 40 °C ambient (IPC9592)	-	7	-	Years

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ELECTROMAGNETIC COMPATIBILITY (EMC) – EMISSIONS

Phenomenon	Conditions / Notes	Standard	Equipment/Performance Class
Conducted	115, 230, 277 V_{RMS}, Maximum load	EN 55032 EN 55011 (ISM) FCC Part 15	B
Radiated		EN 55032 EN 55011 (ISM) FCC Part 15	B (*)
Line Voltage Fluctuation and Flicker	At 20%, 50% and 100% maximum load Nominal input voltages	EN 61000-3-3	
Harmonic Current Emission	230 V_{AC} input voltage, 50 / 60 Hz	EN 61000-3-2	A, D
	230 V_{AC} 50 / 60 Hz, >300 W load	EN 61000-3-2	C

(*) Performance referred to the enclosed package with additional HF chokes on input, output power and signal cables.
Radiated emission relevant to the UCF and PCF package variants, should be assessed at system level.

ELECTROMAGNETIC COMPATIBILITY (EMC) – IMMUNITY

Phenomenon	Conditions / Notes	Standard	Test Level	Criteria
	Reference standard for ITE **Reference standard for Industrial/IMS equipment**	**EN 55024** **EN 61000-6-2**		
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, 20-2700 MHz, 1 KHz, 80% AM.	EN 61000-4-3	3	A
Electric Fast Transient	±2 kV on AC power port for 1 minute	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_{RMS}, 0,15-80 MHz, 1 kHz, 80% AM	EN 61000-4-6	3	A
Dips and Interruptions	**200 – 277 V_{AC}:**			
	Drop-out to 0% for 10 ms	EN61000-4-11		A (**)
	Dip to 40% for 5 cycles (100 ms)	EN61000-4-11		A (de-rate to 900 W)
	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_{AC}:			
	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 400 W)
	Dip to 70% for 25 cycles (500 ms)	EN 61000-4-11		A (de-rate to 700 W)
	Drop-out to 0% for 5 s	EN 61000-4-11		B

(**) Performance referred to +5VSB, +12VSB and V1 (PS_OK goes to low level after 8 ms as per timing described at page 8

SAFETY AGENCIES APPROVALS

Certification Body	Safety Standards	Category
CSA / UL	CSA C22.2 No. 60950-1, UL 60950-1, UL 62368-1; UL8750, CSA22.2 No. 250.13	Audio Video and Information Technology Equipment LED Lighting
IEC IECEE CB Certification	IEC/EN 60950-1, IEC/EN 62368-1	Audio Video and Information Technology Equipment
CE	Directive 2014/35/EU: Electrical Safety: Low Voltage electrical equipment (LVD)	Audio Video and Information Technology Equipment
	Directive 2014/30/EU: Electromagnetic Compatibility (EMC)	
	Directive 2015/863/EU: RoHS 3	
	Meets all essential requiremets of the standard IEC/EN/UL/CSA 61010-1 2nd edition	

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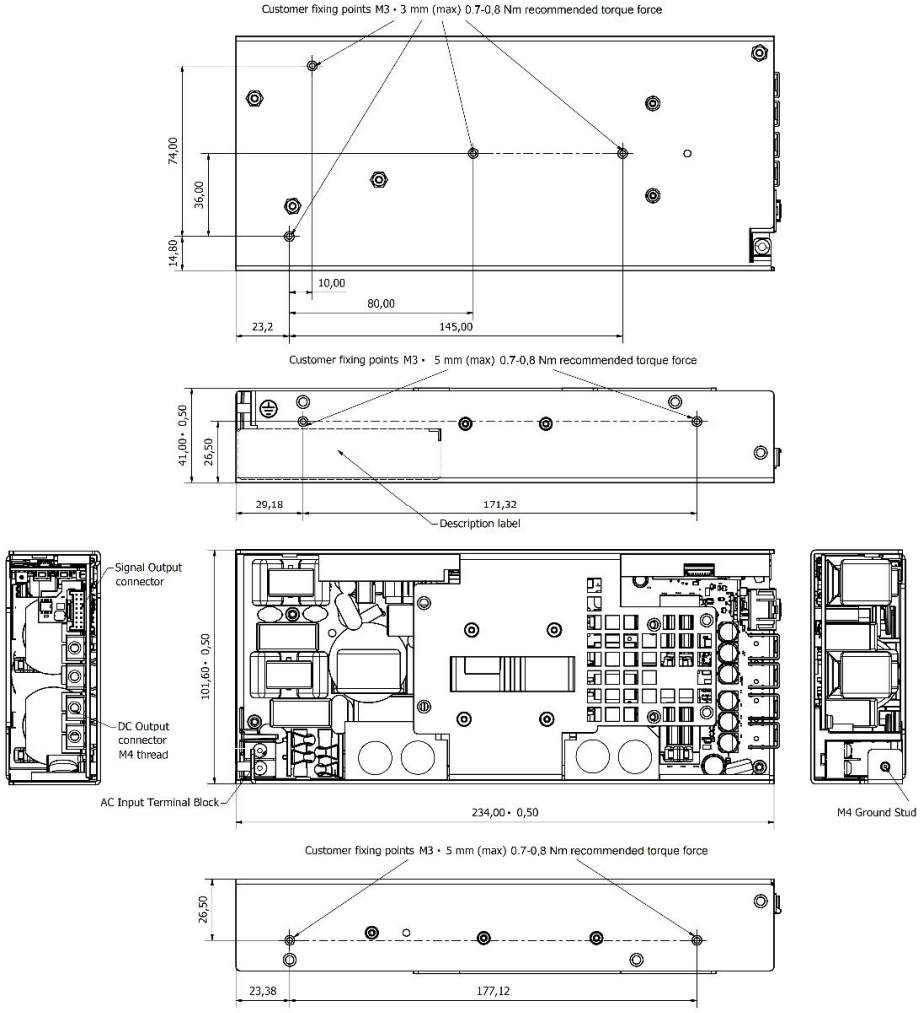
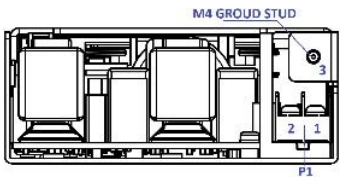
OUTLINE DRAWING AND CONNECTIONS – U-CHASSIS FORCED AIR COOLING (-UCF)

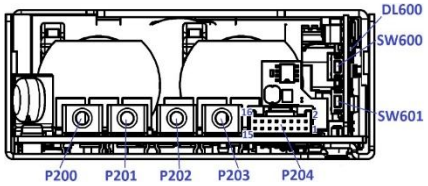
Overall dimensions: 101.6 x 234.0 x 41.0 mm (4.00 x 9.21 x 1.61 in)

Weight: 1150 g (2.53 lb)



AC INPUT CONNECTIONS	DC OUTPUT CONNECTIONS	SIGNAL CONNECTOR	ADDITIONAL CONTROL FUNCTIONS
P1: AMTEK TB25C-B02P-13-00A-L M4 GROUND STUD	**P200, P201, P202, P203:** BRASS M4 THREADED TERMINAL (tight to 0.8-1Nm, max deep screws 7 mm)	**P204:** MOLEX 501876-1640	**SW600, SW601, DL600:**





Ref.	Function
1	Line 1
2	Line 2
3	Protection Earth

Ref.	Function	
	24V Optional	24 / 48V
P200	+V1	+V1
P201	+V1	-
P202	V1 RTN	V1 RTN
P203	V1 RTN	-

Ref.	Function
1	RMT (-)
2	RMT (+)
3	I-SHARE
4	$+5V_{SB}$
5	PS_INHIBIT
6	PS_OK
7	SCL
8	SDA
9	#SMBALERT
10	ADDR0
11	-PS_INHIBIT
12	ADDR1
13	RSVD_RX (OUT)
14	RSVD_TX (OUT)
15	RTN
16	$+12V_{SB}$

Ref.	Function
SW600	V1_ADJ (UP)
SW601	V1_ADJ (DOWN)
DL600	Bi-colour LED
Off	No AC/DC input power provided
Blinking Green	Input power good, standby active, V1 inhibited
Steady Green	V1 Active
Steady or Blinking red	Power Supply Fault

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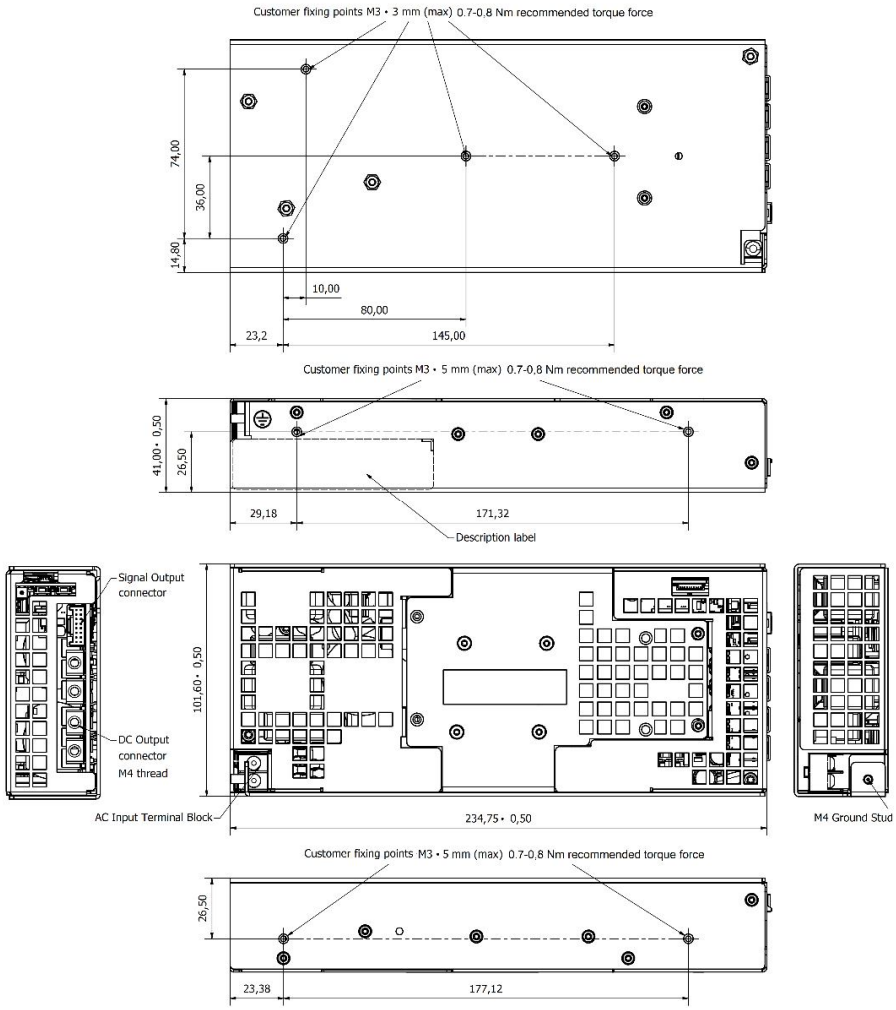
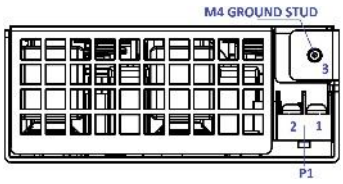
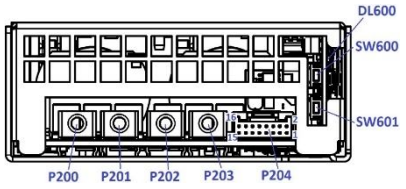
OUTLINE DRAWING AND CONNECTIONS – PERFORATED COVER FORCED AIR COOLED (-PCF)

Overall dimensions: 101.6 x 234.7 x 41.0 mm (4.00 x 9.24 x 1.61 in)
Weight: 1250 g (2.75 lb)



AC INPUT CONNECTIONS	DC OUTPUT CONNECTIONS	SIGNAL CONNECTOR	ADDITIONAL CONTROL FUNCTIONS
P1: AMTEK TB25C-B02P-13-00A-L M4 GROUND STUD	**P200, P201, P202, P203:** BRASS M4 THREADED TERMINAL (tight to 0.8-1Nm, max deep screws 7 mm)	**P204:** MOLEX 501876-1640	**SW600, SW601, DL600:**





Ref.	Function
1	Line 1
2	Line 2
3	Protection Earth

Ref.	Function	
	24V Optional	24 / 48V
P200	+V1	+V1
P201	+V1	-
P202	V1 RTN	V1 RTN
P203	V1 RTN	-

Ref.	Function
1	RMT (-)
2	RMT (+)
3	I-SHARE
4	+5V$_{SB}$
5	PS_INHIBIT
6	PS_OK
7	SCL
8	SDA
9	#SMBALERT
10	ADDR0
11	-PS_INHIBIT
12	ADDR1
13	RSVD_RX (OUT)
14	RSVD_TX (OUT)
15	RTN
16	+12V$_{SB}$

Ref.	Function
SW600	V1_ADJ (UP)
SW601	V1_ADJ (DOWN)
DL600	Bi-colour LED
Off	No AC/DC input power provided
Blinking Green	Input power good, standby active, V1 inhibited
Steady Green	V1 Active
Steady or Blinking red	Power Supply Fault

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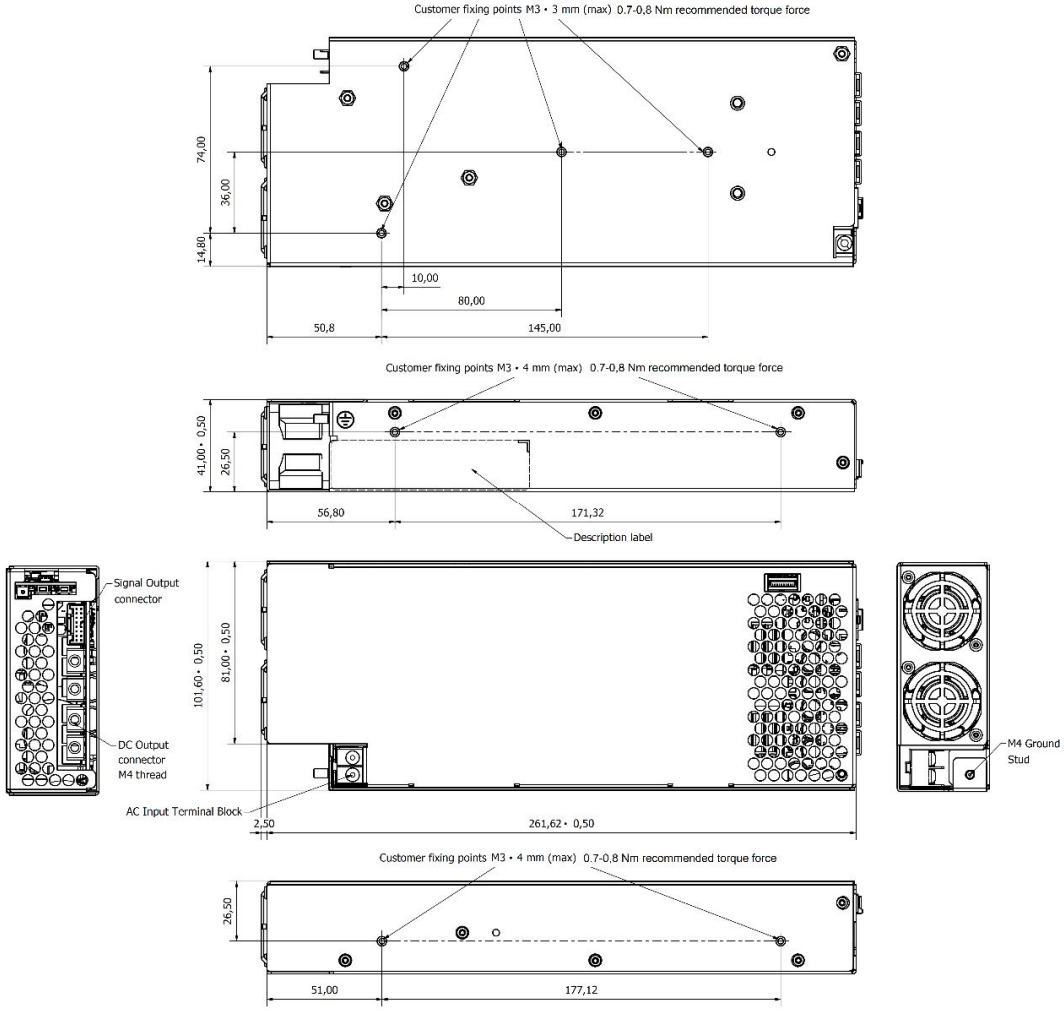
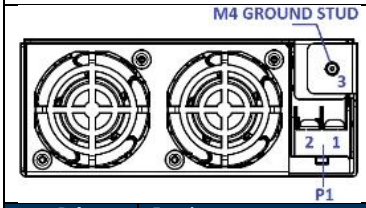
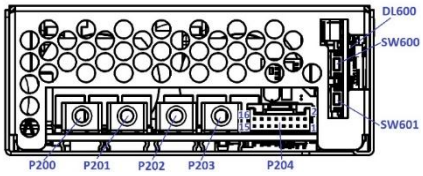
OUTLINE DRAWING AND CONNECTIONS – FRONT MOUNTED FAN (-FF)

Overall dimensions: 101.6 x 264.12 x 41.0 mm (4.00 x 10.40 x 1.61 in)
Weight: 1550 g (3.42 lb)



AC INPUT CONNECTIONS	DC OUTPUT CONNECTIONS	SIGNAL CONNECTOR	ADDITIONAL CONTROL FUNCTIONS
P1: AMTEK TB25C-B02P-13-00A-L M4 GROUND STUD	**P200, P201, P202, P203:** BRASS M4 THREADED TERMINAL (tight to 0.8-1Nm, max deep screws 7 mm)	**P204:** MOLEX 501876-1640	**SW600, SW601, DL600:**





Ref.	Function
1	Line 1
2	Line 2
3	Protection Earth

Ref.	Function	
	24V Optional	24 / 48V
P200	+V1	+V1
P201	+V1	-
P202	V1 RTN	V1 RTN
P203	V1 RTN	-

Ref.	Function
1	RMT (-)
2	RMT (+)
3	I-SHARE
4	$+5V_{SB}$
5	PS_INHIBIT
6	PS_OK
7	SCL
8	SDA
9	#SMBALERT
10	ADDR0
11	-PS_INHIBIT
12	ADDR1
13	RSVD_RX (OUT)
14	RSVD_TX (OUT)
15	RTN
16	$+12V_{SB}$

Ref.	Function
SW600	V1_ADJ (UP)
SW601	V1_ADJ (DOWN)
DL600	Bi-colour LED
Off	No AC/DC input power provided
Blinking Green	Input power good, standby active, V1 inhibited
Steady Green	V1 Active
Steady or Blinking red	Power Supply Fault

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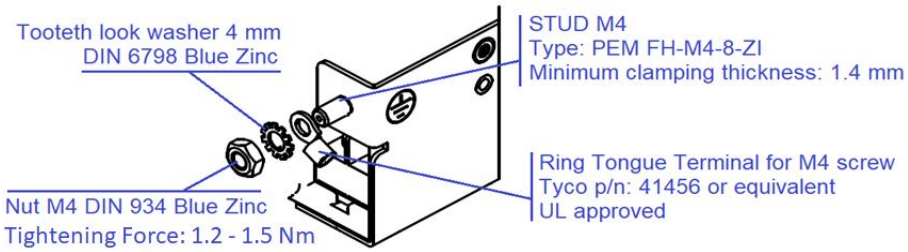
PROTECTION EARTH CONNECTION INSTRUCTIONS



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