

4600W Single or Dual Output, 3Φ Input Industrial Power Supplies

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Industrial



COTS



Test



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The TPS4500 series of industrial AC-DC power supplies offer output power levels up to 4600W in a 2U high package with a 3 phase 360 - 528Vac supply input. The power supply can be used as a single or a dual output, sharing the loads in any proportion up to the rated output. Power Supplies can be connected in series, or in parallel, to increase the output voltage or power. Features include voltage and current programming (CV / CC operation), remote on/off, a standby supply, PMBus™ communication, and a wide operating temperature range of -40°C to +70°C. The TPS4500 is also designed to meet MIL-STD-810H vibration and shock.

Features	Benefits
• 400/440/480Vac (Nominal) 3 Phase Delta or Wye	• Global Use
• Wide Range Adjustable Dual Outputs	• Versatile Application
• Voltage and Current Programming (CV / CC mode)	• Flexible Control and Adjustment
• -40°C (start up) to +70°C operation	• Suitable for Rugged Environments
• 93% Typical Efficiency	• Less Energy Used
• PMBus Communication	• Remote Output Programming and Monitoring

Model Selector

Model	Nominal Output Voltage (V)	Voltage Adjust (V) Using Trim Potentiometer	Voltage Adjust (V) Using Voltage Programming	Voltage Adjust (V) Using PMBus	Rated Current (A)	Maximum Current ⁽¹⁾ (A)	Rated Power (W)	Max Power (W) at Nominal Voltage
TPS4500-92/184	92	55 - 96.5	55 - 96.5	10 - 96.5	49	50	4500	4600
TPS4500-92/184	184	110 - 193	110 - 193	20 - 193	24.5	25	4500	4600
TPS4500-110/220	110	88 - 132	66 - 132	12 - 132	41	41.8	4500	4600
TPS4500-110/220	220	176 - 264	132 - 264	24 - 264	20	20.9	4500	4600

Related Products

Type	Part Number	Description
EMC filter	RTMN-5020	High attenuation 20A 500Vac 3-phase input two stage filter

Specifications

Model		TPS4500
Input		
Input Voltage Range (Operating)	Vac	360 - 528, Delta or Wye 3 phase
Nominal Input Voltage Range	Vac	400 - 480, Delta or Wye 3 phase (Note: Safety certified for 360-528Vac only)
Input Frequency	Hz	47 - 63 (Note: Safety certified for 50 to 60Hz only)
Input Current (At nominal Vin)	A	9 per phase (steady state)
Inrush Current at 400-480Vac (Cold Start)	A	<25 per phase (excluding initial filter capacitor charging <2ms)
Dropped Phase Power (400 / 480Vac)	W	2250 / 2925
Leakage Current (RMS)	mA	<3
Power Factor (400-480Vac)	-	0.92 typical at rated load, nominal Vin
Harmonics	-	Not applicable
Hold Up Time	ms	>10 at 80% of rated current, nominal input/output voltage
Efficiency (Typical)	%	93
Conducted & Radiated EMI	-	EN55032-A Conducted and radiated in end system
Immunity	-	EN61000-4, see immunity table.
Line Dip	-	SEMI F47-0706 at 480Vac nominal (Criteria B)
Safety Certifications and Markings	-	IEC/UL/CSA/EN62368-1, CE Mark and UKCA Mark

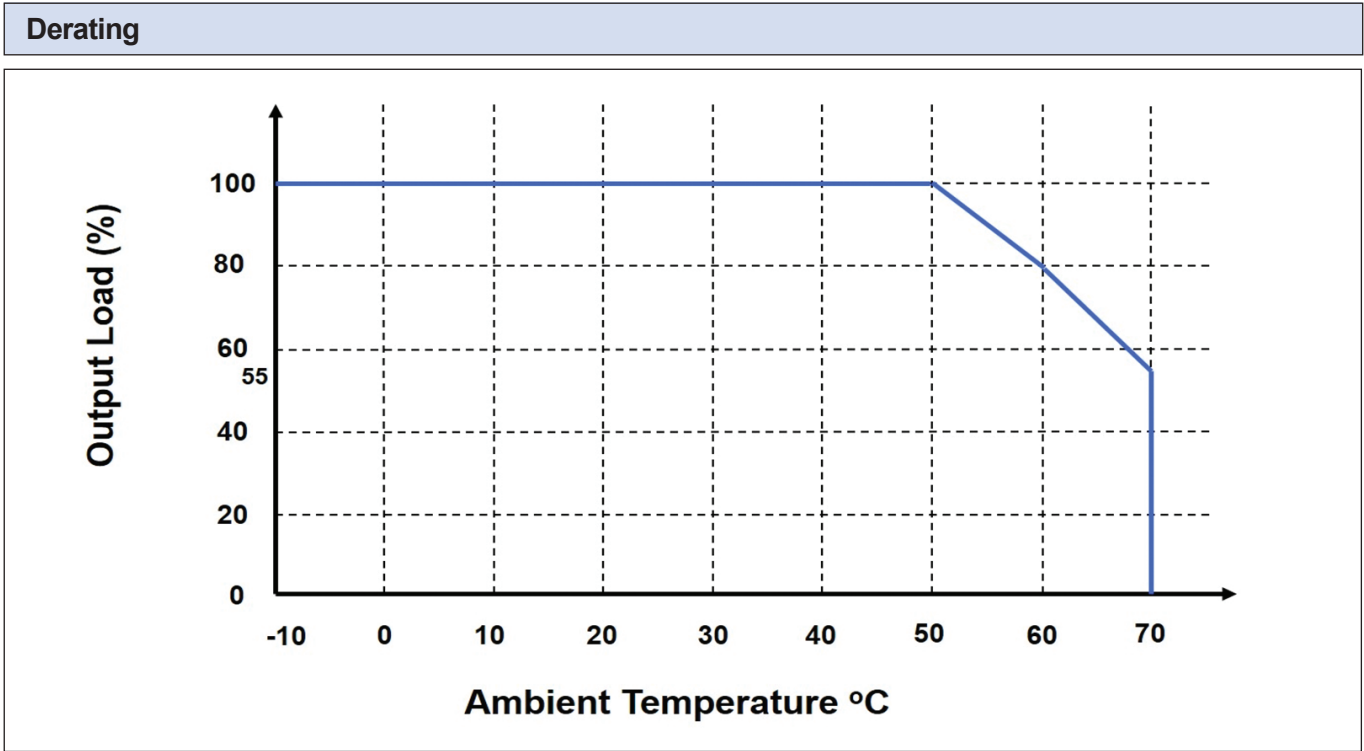
Immunity				
Test	Standard	Test Level	Criteria	Notes
ESD	EN61000-4-2	±8 kV air discharge, ±4 kV contact discharge	TBD	See immunity test report on website
Radiated Susceptibility	EN61000-4-3	3 V/m from 80-1000 MHz (80% AM at 1kHz)		
Electrical Fast Transient Burst	EN61000-4-4	Power line pulses of ± 1 kV; I/O line pulses of ± 0.5 kV		
Surge	EN61000-4-5	3±2kV common mode, ±1kV differential mode		
Conducted Susceptibility	EN61000-4-6	3 Vrms, 150 kHz - 80 MHz 1 kHz 80% AM		
Magnetic fields	EN61000-4-8	Inductive loop at 50 Hz, to 30.0 amps (rms) per meter & 300.0 amps (rms) per meter		
Voltage Dips and Input Interruptions	EN61000-4-11	Voltage Dips of 30% and >95%; Interruptions of >95%.		

Specifications		
Model		TPS4500
Output		
Line Regulation	%	<0.25
Load Regulation	%	<0.5 (<3 on unregulated output)
Total Regulation	%	<1.75
Cross Regulation	%	<3
Warm Up Drift	%	<0.25
Temperature Stability	%	0.05 of rated Vout for 8hrs after 30min warmup
Temperature Coefficient	ppm/°C	200
Ripple & Noise (pk-pk) Maximum	%	2
Minimum Load	A	A minimum load of 0.5A is required to maintain regulation and ripple spec throughout the output voltage
Overcurrent Protection	%	Adjustable (>100 - 65 of maximum rated current). Constant current style. Optional time delayed shutdown with auto restart - contact factory
Overvoltage Protection	%	115% of output voltage set point (tracking). Cycle AC or use the remote on/off to reset
Overtemperature Protection	-	Internal thermostat. Automatic reset
Fan Fail	-	Blocked or fan failure detection.
Remote Sense	-	None
Remote On/Off	-	Enable or inhibit (selectable)
Voltage Programming	-	0 - 5V external voltage adjusts the output from Vout max to Vout min
Overcurrent Programming	-	0 - 5V external voltage adjusts the current limit from Iout max to Iout min
DC Good	-	Open Collector, ON when output is above approximately 90% of output set point (tracking)
AC Fail	-	Open Collector, ON when AC input is above 340Vac, the load is >30% and unit is enabled
Dropped Phase Warning	-	Open collector, OFF during normal operation
Standby Voltage	-	11.2 - 12.5V, 0.3A
Indicators	-	Green LEDs indicates DC is OK and AC is ON. Blinking red/green during dropped phase (Load >30%)
Parallel Operation	-	Single wire current share, up to 8 units. Derate to 90% output power
Environmental		
Operating Temperature (-40°C start-up)	°C	-10° to +70°, derate linearly from 100% to 80% load from 50° to 60°, and from 80% to 55% at 70° (At -40°C and nominal input. A 10 min warm up at 80% load is required to meet specification)
Storage Temperature	°C	-40 to +85
Humidity (non condensing)	%RH	10 - 95
Pollution Degree	-	PD 2
Cooling	-	Internal variable speed fan
Altitude	m	4,000
Withstand Voltage (For 1 minute)	Vac/Vdc	Input to Ground 2,000Vac, Input to Output 3,000Vac, Output to Ground 500Vdc
Isolation Resistance	MΩ	>100 at 25°C, 70%RH & 500Vdc
Vibration (Operating)	-	Designed to meet MIL-STD-810H, Method 514.8, Proc I, Category 1, 10
Shock	-	Designed to meet MIL-STD-810H, Method 516.8, Procedure I, IV (Logistics) & VI

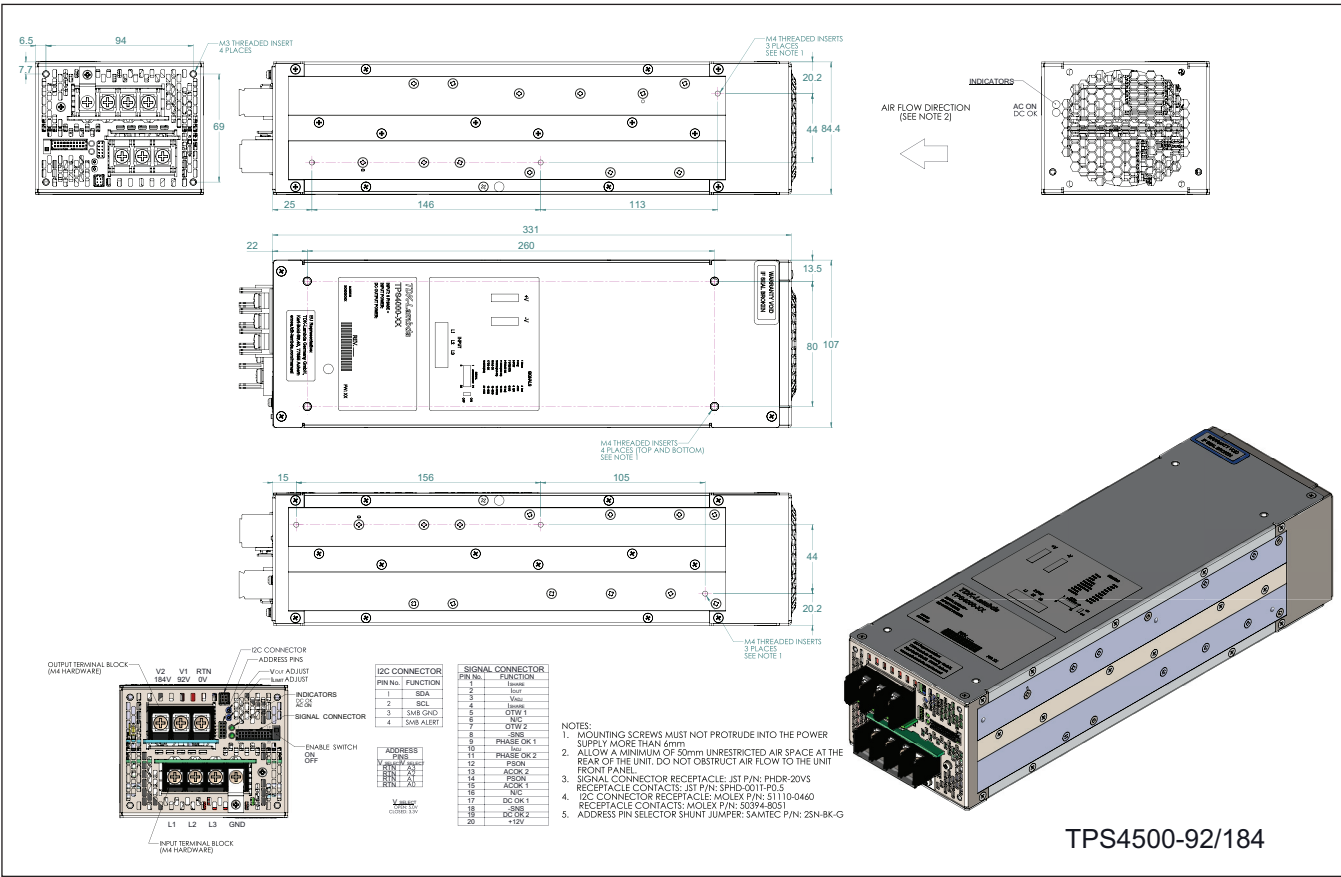
Specifications		
Model		TPS4500
Other		
Weight (Typ)	g	4,000
Size (WxHxD)	mm	107 x 85 x 335 (excluding output connectors)
Size (WxHxD)	Inches	4.21 x 3.35 x 13.2 (excluding output connectors)
Mating Connectors	-	Signal: Housing, JST PHDR-20VS, Crimp terminals, SPHD-001T-P0.5 PMBus shunt jumper: Samtec 2SN-BK-G
MTBF - Telcordia SR-332 issue 3 ⁽²⁾	Hours	250,000
Warranty	Years	3

PMBus Functions
Output Voltage Monitoring
Output Current Monitoring
Internal Temperature Monitoring
Remote On/Off Programming
Remote Voltage Programming
Remote Overcurrent Programming
Fault Clearing
Reading Manufacturing Related Data

Notes
See website for detailed specifications, test methods and installation manual
(1) Rating at nominal output only
(2) Method 1, Ground Benign, 25C, nominal input



Outline Drawings & Pin Out





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