

# ARTESYN CSU550AP

550 Watts Distributed Power System



Advanced Energy's Artesyn CSU550AP power supply is housed in a 1U high rack-mount enclosure measuring just 2.89 x 7.28 inches (73.5 x 185.0 mm). This form factor is significantly narrower and shorter than that of similarly rated earlier generation power supplies — freeing up valuable system space — and is achieved by use of the latest power switching technology and high density component packaging techniques. This form factor conforms to the standard market's Common Redundant Power Supplies.

## DATA SHEET

### Front-end Bulk Power

### Total Output Power:

550 W continuous

### Wide Input Voltage:

90 - 264 Vac; 164 - 320 Vdc

### SPECIAL FEATURES

- 550 W output power
- High power and short form factor
- 1U power supply
- High density design: 17 W/in<sup>3</sup>
- Active Power Factor Correction
- EN61000-3-2 Harmonic compliance
- Inrush current control
- 80plus Platinum efficiency
- N+M redundant N+M ≤ 4
- Hot-pluggable
- Active current sharing
- Full digital control
- PMBus compliant
- Accurate input power reporting
- Reverse airflow option

### COMPLIANCE

- Conducted/Radiated EMI Class A
- EN61000-4-11

### SAFETY

- UL/cUL
- UL + CB Report
- CE Mark
- CCC
- BSMI
- KC
- TÜV



**ELECTRICAL SPECIFICATIONS**

Input						
Input range	90 - 264 Vac; 164 - 320 Vdc					
Frequency	47 Hz to 63 Hz					
Efficiency	80plus Platinum efficiency					
Max input current	8.0 Arms @ 90 Vac					
Inrush current	10 Apk					
Conducted EMI	Class A -6 dB					
Radiated EMI	Class A -6 dB					
Power factor	>0.89 beginning at 10% load					
ITHD	<10% beginning at 20% load					
Leakage current	0.85 mA					
Hold-up time	13 ms at full load					
Output						
	Main DC Output			Standby DC Output		
	MIN	NOM	MAX	MIN	NOM	MAX
Nominal setting (12 V / 1 A, 12 VSB / 0.1 A)	12.05	12.15	12.25	12.05	12.2	12.35
Total output regulation range	11.4 V		12.6 V	11.4 V		12.6 V
Dynamic load regulation range	11.4 V		12.6 V	11.4 V		12.6 V
Output ripple			120 mV			120 mV
Output current	0		45 A	0		2.5 A
Current sharing	Within ±5% @ full load rating			N/A		
Capacitive loading	500 µF		25000 µF	100 µF		3100 µF
Start-up from AC to output			3000 ms			1500 ms
Output rise time	5 ms		70 ms	1 ms		25 ms

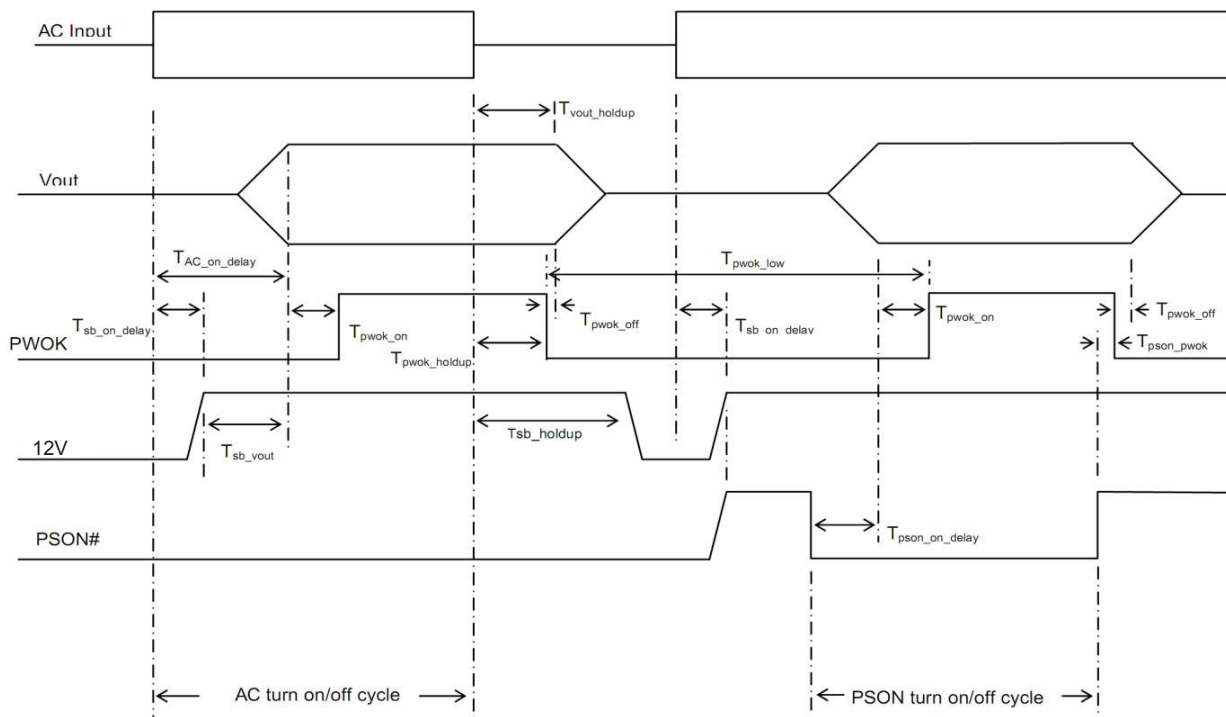
**ELECTRICAL SPECIFICATIONS (CONTINUED)**

Protections (Main Output)					
	Minimum	Nominal	Maximum	Units	Comment
Peak current			54	A	
Output OCP	55		62	A	
Dynamic loading setup	11.4		12.6	V	60% rated load step, 0.5 A/ $\mu$ s slew rate; 2000 $\mu$ F / 1 A min
Output OVP	13.3		14.5	V	Latch
Overtemperature protection		Yes			
Fan fault protection		Yes			
Standby Output					
Peak current			2.75	A	
Output OCP	3.0		4.5	A	
Output OVP	13.3		14.5	V	
Dynamic loading setup			$\pm$ 5	%	Load step 1A, Slew rate: 0.5 A / $\mu$ s / 100 $\mu$ F
LED Indicators					
POWER SUPPLY CONDITION					LED STATE
Normal work					GREEN
No AC power to all power supplies					OFF
AC present / Only 12 VSB on (PS off) or PS in CR state					1 Hz Blink GREEN
AC cord unplugged; with a second power supply in parallel still with AC input power					RED
Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan, input voltage lower than 90 Vac (not warning above 90 V condition, must be warning state below 85 V condition)					1 Hz Blink RED
Power supply critical event causing a shutdown; failure, OCP, OVP, fan fail					RED
Firmware Reporting And Monitoring					
	Accuracy Range				
Output loading	10% to 30%	> 30% to 50%	> 50% to 100%		
READ_PIN and READ_EIN	$\pm$ 6 W	$\pm$ 3%	$\pm$ 2%		
READ_IOUT	$\pm$ 0.4 A	$\pm$ 2%	$\pm$ 2%		
READ_TEMPERATURE	$\pm$ 3 $^{\circ}$ C				

TIMING SPECIFICATIONS

	Description	Min	Max	Unit
T <sub>vout_rise</sub>	12 V main output voltage rise time	5.0	70	ms
	12 VSB output voltage rise time	1	25	ms
T <sub>sb_on_delay</sub>	Delay from AC being applied to 12 Vsb being within regulation		1500	ms
T <sub>ac_on_delay</sub>	Delay from AC being applied to all output voltages being within regulation		3000	ms
T <sub>vout_holdup</sub>	Time 12 V <sub>I</sub> output voltage stay within regulation after loss of AC	13		ms
T <sub>pwok_holdup</sub>	Delay from loss of AC to de-assertion of PWOK	12		ms
T <sub>pson_on_delay</sub>	Delay from PSON# active to output voltages within regulation limits	5	400	ms
T <sub>pson_pwok</sub>	Delay from PSON# deactivate to PWOK being de-asserted		5	ms
T <sub>pwok_on</sub>	Delay from output voltages within regulation limits to PWOK asserted at turn on	100	500	ms
T <sub>pwok_off</sub>	Delay from PWOK de-asserted to output voltages dropping out of regulation limits	1		ms
T <sub>pwok_low</sub>	Duration of PWOK being in the de-asserted state during an off/on cycle using AC or the PSON signal	100		ms
T <sub>sb_vout</sub>	Delay from 12VSB being in regulation to O/Ps being in regulation at AC turn on	50	1000	ms
T <sub>12VSB_holdup</sub>	Time the 12VSB output voltage stays within regulation after loss of AC	70		ms

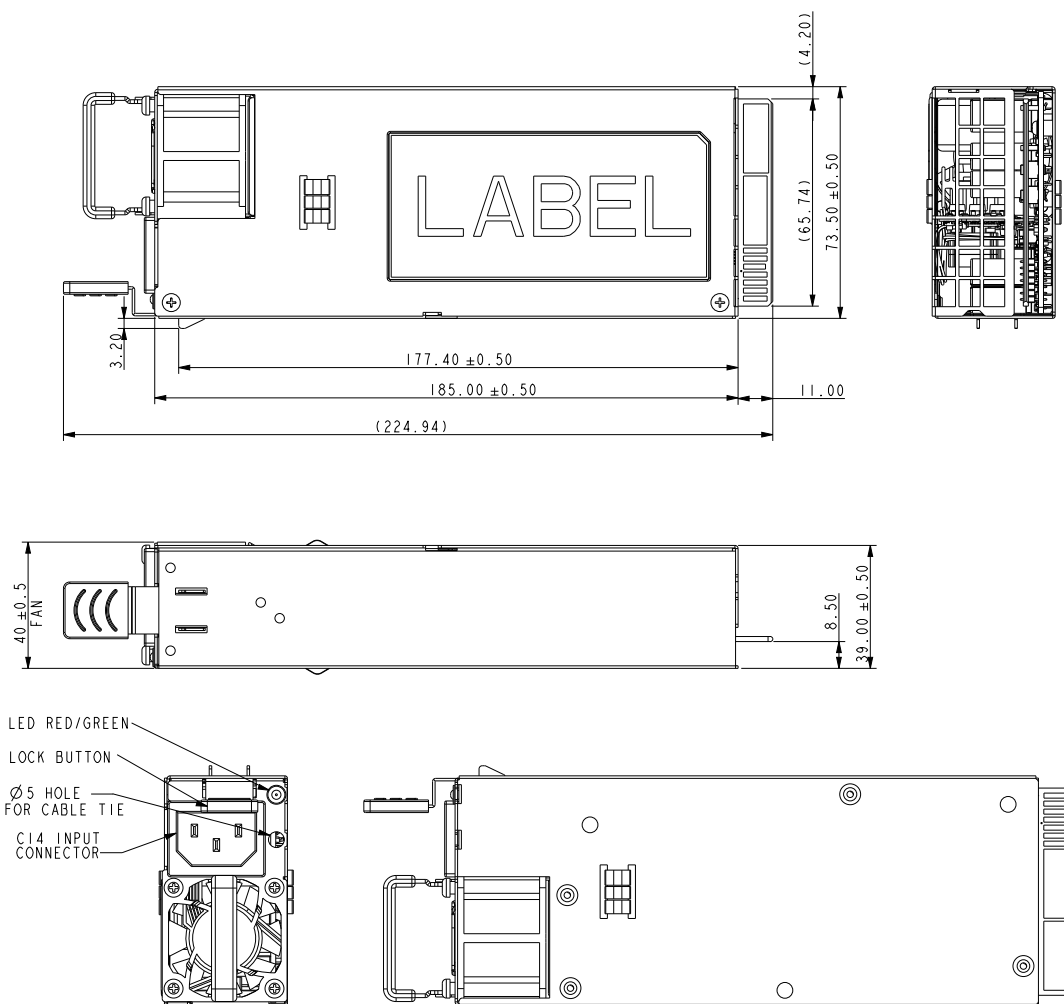
TIMING DIAGRAM



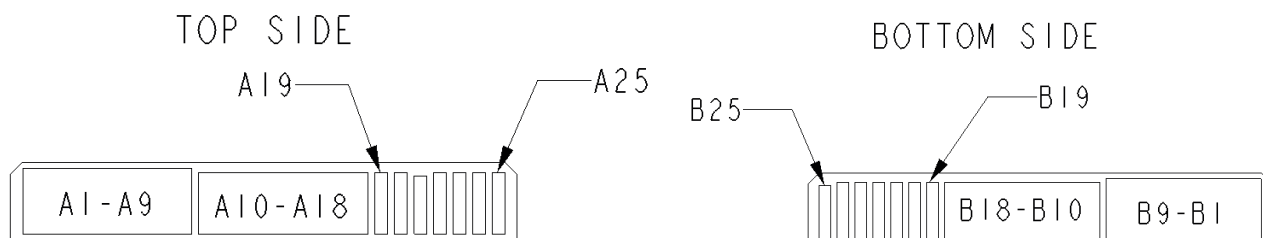
## ENVIRONMENTAL SPECIFICATIONS

Operating temperature	0 to 50 °C, the maximum operating temperature (50 °C) is to be derated by 1 °C per 300 m above 2000 m
Operating altitude	up to 5000 m
Operating humidity	+5% to +85% non-condensing
Storage temperature	-40 °C to +70 °C, non-condensing
Storage humidity	+5% to +95% non-condensing
Non-operating altitude	up to 15,200 meters
Vibration and shock	Standard operating/non-operating random shock and vibration
RoHS compliance	Yes
MTBF	250,000 hours per Telcordia Issue 2, Method 1, Case 3 at 25 °C ambient at full load

## MECHANICAL OUTLINE



**POWER SUPPLY OUTPUT CARD EDGE**



**CONNECTOR DEFINITIONS**

Output connector part number	Card-edge
Mating connector part number	2x25 pin configuration of the FCI power card connector 10035388-102LF

Output Connector Pin Configuration			
Pin	Name	Pin	Name
A1-A9	GND	B1-B9	GND
A10-A18	+12 V	B10-B18	+12 V
A19	SDA	B19	A0 (SMBus address)
A20	SCL	B20	A1 (SMBus address)
A21	PSON	B21	12 VSB
A22	SMBAlert#	B22	CR_BUS#
A23	-VSENSE	B23	12 V load share
A24	+VSENSE	B24	Present
A25	PWOK	B25	Reserved

Note: PSON connect to GND for power up.

**ORDERING INFORMATION**

Model number	Airflow	Nominal Output Voltage	Set Point	Regulation Band	Minimum Current	Maximum Current	Output Ripple P/P	Standby
CSU550AP-3	Normal fan	12.0 Vdc	11.9 - 12.1 Vdc	11.4 - 12.6 Vdc	0 A	45 A	120 mV	12.0 V @ 2.5 A
CSU550AP-3-001	Reverse fan	12.0 Vdc	11.9 - 12.1 Vdc	11.4 - 12.6 Vdc	0 A	45 A	120 mV	12.0 V @ 2.5 A



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## ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE

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