

## Preliminary Data Sheet

**Front-end Bulk Power**  
**Total Output Power:**  
 2000 W maximum  
**AC and DC Input Options:**  
 200-264 Vac; 220-320 Vdc

### SPECIAL FEATURES

- 2000 W maximum output power
- High power and short form factor
- 1U power supply
- High density design:  
63.5 W/in<sup>3</sup> (3.8 W/cm<sup>3</sup>)
- Active Power Factor Correction
- EN61000-3-2 Harmonic compliance
- Inrush current control
- 80 PLUS® Platinum efficiency
- N+N or N+1 redundant
- Hot-pluggable
- Active current sharing
- Full digital control
- PMBus® compliant
- Compatible with Artesyn's Universal PMBus GUI
- Reverse airflow option

### COMPLIANCE

- Conducted/Radiated EMI Class A
- IEC 60950
- RoHS

### SAFETY

- UL/cUL
- UL + CB Report
- CE Mark
- CQC
- BSMI
- KC
- TÜV
- BIS
- EAC
- IEC 62368 CB Certificate

# CSU2000AP

## 2000 Watts Distributed Power System



### Electrical Specifications

Input						
Input range	220-264 Vac: 2000 W 200-220 Vac: 1780 W			220-320 Vdc		
Frequency	47 Hz to 63 Hz					
Efficiency	80 PLUS® Platinum efficiency					
Max input current	10 Arms @ 200 Vac/220 Vac					
Inrush current	35 Apk					
Conducted EMI	Class A					
Radiated EMI	Class A					
Power factor	>0.9 beginning at 10% load					
ITHD	<10% beginning at 20% load					
Leakage current	0.875 mA					
Hold-up time	11 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)	11.9	12.0	12.1	11.7	12.0	12.3
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	1		166.7 A	0		3 A
Current sharing	Within ±6% @ full load rating			N/A		
Capacitive loading	2,000 µF		50,000 µF	100 µF		3100 µF
Start-up from AC to output			3000 ms			1500 ms
Output rise time	5 ms		70 ms	5 ms		70 ms

## Electrical Specifications

### Protections (Main Output)

	Minimum	Nominal	Maximum	Units	Comment
Peak current			247	A	At 220 Vac, 10 ms allowable duration
Output OCP		191		A	At 220 Vac, 20 s allowable duration
Dynamic loading setup			±5	%	60% rated load step, 0.25 A/μs slew rate; Tested with TBD minimum system capacitance
Output OVP	13.3		14.5	V	Latch
Overtemperature protection		Yes			
Fan fault protection		Yes			

### Standby Output

Output OCP	4.2		5.0	A	
Output OVP	13.3		14.5	V	
Dynamic loading setup			±5	%	50% rated load step Slew rate: 0.25 A / μs / 100 μF

## Electrical Specifications

### 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

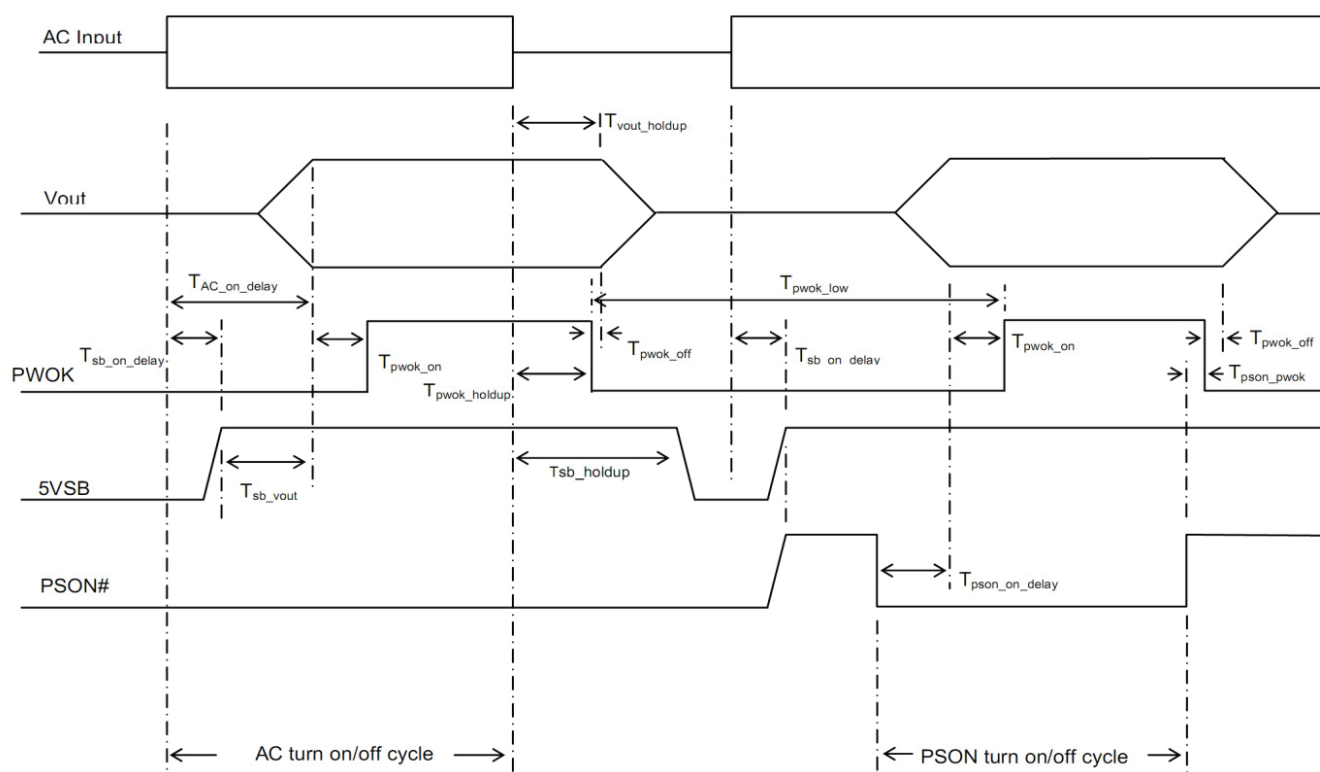
### Firmware Reporting And Monitoring

	Accuracy Range		
Output loading	10% to 30%	> 30% to 50%	> 50% to 100%
READ_PIN and READ_EIN	±5 W	±3%	±3%
READ_IOUT	±3%	±2%	±2%
READ_TEMPERATURE	±3 °C		

## Timing Specifications

	Description	Min	Max	Unit
$T_{vout\_rise}$	12 V main output voltage rise time	5.0	70	ms
	12 VSB output voltage rise time	1	25	ms
$T_{sb\_on\_delay}$	Delay from AC being applied to 12 Vsb being within regulation		1500	ms
$T_{ac\_on\_delay}$	Delay from AC being applied to all output voltages being within regulation		3000	ms
$T_{vout\_holdup}$	Time 12 V <sub>I</sub> output voltage stay within regulation after loss of AC	13		ms
$T_{pwok\_holdup}$	Delay from loss of AC to de-assertion of PWOK	12		ms
$T_{pson\_on\_delay}$	Delay from PSON# active to output voltages within regulation limits	5	400	ms
$T_{pson\_pwok}$	Delay from PSON# deactivate to PWOK being de-asserted		5	ms
$T_{pwok\_on}$	Delay from output voltages within regulation limits to PWOK asserted at turn on	100	500	ms
$T_{pwok\_off}$	Delay from PWOK de-asserted to output voltages dropping out of regulation limits	1		ms
$T_{pwok\_low}$	Duration of PWOK being in the de-asserted state during an off/on cycle using AC or the PSON signal	100		ms
$T_{sb\_vout}$	Delay from 12VSB being in regulation to O/Ps being in regulation at AC turn on	50	1000	ms
$T_{12VSB\_holdup}$	Time the 12VSB output voltage stays within regulation after loss of AC	70		ms

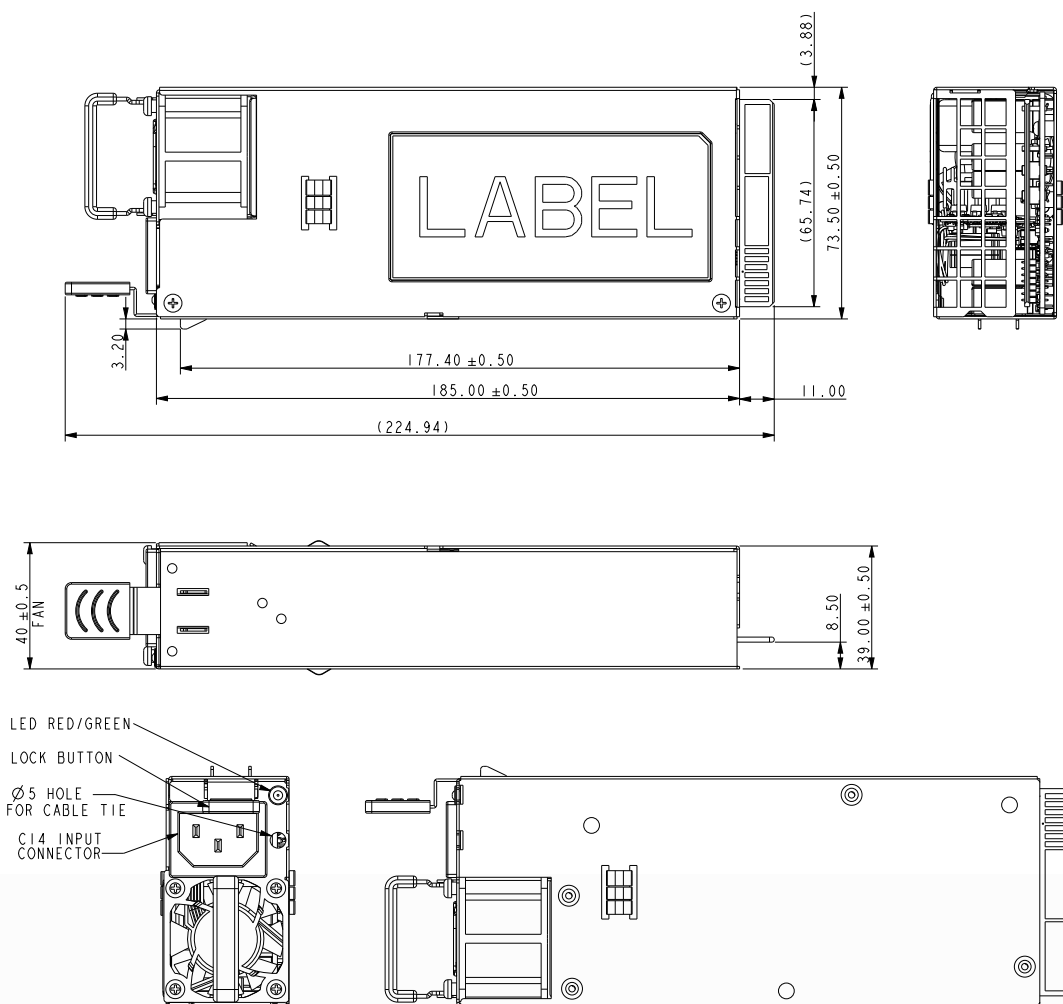
## Timing Diagram



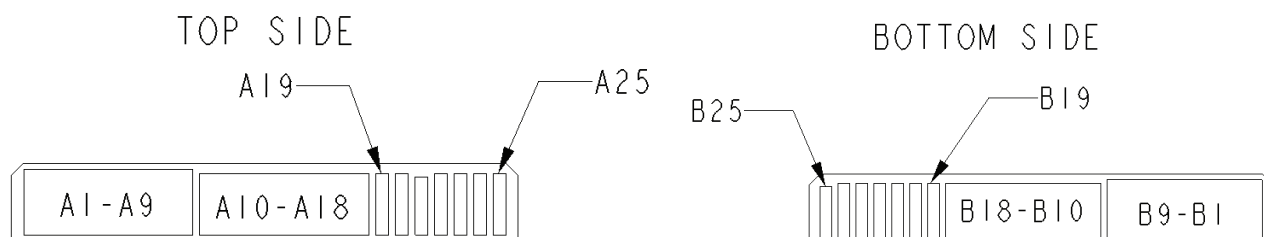
## Environmental Specifications

Operating temperature	0 to 50 °C
Operating altitude	up to 5000 m
Operating humidity	+5% to +95% 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 3 at 25°C, nominal input and 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	SMBAAlert#	B22	CR_BUS#
A23	-VSENSE	B23	12 V load share
A24	+VSENSE	B24	Present
A25	PWOK	B25	Reserved

## Ordering Information

Model number	Airflow	Nominal Output Voltage	Set Point	Regulation Band	Minimum Current	Maximum Current	Output Ripple P/P	Standby
CSU2000AP-3	Normal fan	12.0 Vdc	11.9 - 12.1 Vdc	11.4 - 12.6 Vdc	1 A	166.7 A	120 mV	12.0 V @ 3 A
CSU2000AP-3-001	Reverse fan	12.0 Vdc	11.9 - 12.1 Vdc	11.4 - 12.6 Vdc	1 A	TBD	120 mV	12.0 V @ 3 A

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