

# ARTESYN CSU2000ADC

2000 Watts Distributed Power  
System



Advanced Energy's Artesyn CSU2000ADC is housed in the industry standard 1U x 73.5 x 185 mm form factor featuring -48 VDC input voltage. This DC/DC power supply belongs to the CRPS family of products, and matches the mechanical form and fit of Advanced Energy's AC/DC power supplies. The common form, fit, and function for all products in the family provides a path for power capacity flexibility, future-proofing your system designs.

## AT A GLANCE

### Front End Bulk Power

### Total Output Power

2000 W continuous

### Wide Input Voltage

-40 to -72 VDC

## SPECIAL FEATURES

- 2000 W output power
- High power and short form factor
- 1U power supply
- High density design: 62 W/in<sup>3</sup>
- Uses two-hole terminal lugs to handle high input current
- Inrush current control
- N+M redundant N+M ≤ 4
- Hot-pluggable
- Active current sharing
- Full digital control
- PMBus® compliant
- Accurate input power reporting
- Compatible with Artesyn's Universal PMBus GUI
- Reverse airflow option

## COMPLIANCE

- Conducted/Radiated EMI Class A

## SAFETY

- IEC 60950, IEC 62368
- UL/cUL
- UL + CB Report
- CQC
- KC
- BIS
- CE Mark
- UKCA Mark

## TARGET APPLICATIONS

- Server and Storage
- Networking

## ELECTRICAL SPECIFICATIONS

Input						
Input range	-40 to -72 VDC					
Efficiency	94% peak					
Max input current	65 A at -40 VDC input					
Inrush current	ETSI 300 132-2 Annex C					
Conducted EMI	Class A					
Radiated EMI	Class A					
Hold-up time	2.4 ms minimum 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 A)	11.8 V	12.2 V	12.6 V	11.4 V	12.0 V	12.6 V
Total output regulation range	11.6 V		12.8 V	11.4 V		12.6 V
Dynamic load regulation range <sup>1</sup>	11.6 V		12.8 V	11.4 V		12.6 V
Output ripple			120 mV			120 mV
Output current	1 A		163.9 A	0 A		3.5 A
Current sharing	Within ±6% @ full load rating			N/A		
Capacitive loading	2000 µF		50000 µF	47 µF		3100 µF
Start-up from AC to output			3000 ms			1500 ms

Note 1 - Dynamic load step for main output: 60% rated load step, 0.5 A/µs slew rate; 2000 µF / 1 A min  
 Dynamic load step for standby output: 50% rated load step, 0.5 A/µs slew rate; 100 µF

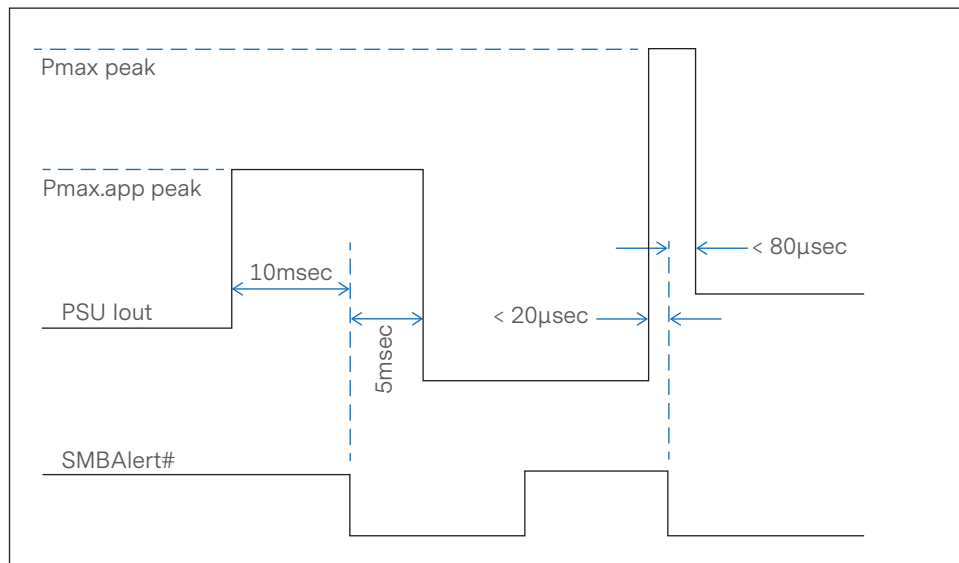
## ELECTRICAL SPECIFICATIONS (CONTINUED)

Protections (Main Output)					
	MIN	NOM	MAX	Units	Comment
Peak current			264	A	
Output OCP	261		267	A	
Output OVP	13.3		14.5	V	Latch
Overtemperature protection		Yes			
Fan fault protection		Yes			
Standby Output					
Output OCP	4.0		5.0	A	
Output OVP	13.3		14.5	V	
LED Indicators					
Power Supply Condition				LED State	
Normal work				Green	
No DC input power to all power supplies				Off	
DC input present / Only 12 Vsb on (PS off) or PS in CR state				1 Hz Blink Green	
DC input cord unplugged; with a second power supply in parallel still with DC input power				Amber	
Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan				1 Hz Blink Amber	
Power supply critical event causing a shutdown; failure, OCP, OVP, fan fail				Amber	
Firmware Reporting And Monitoring					
				Accuracy Range	
Output loading				2% to 7.5%	> 7.5% to 15% > 15% to 100%
READ_PIN and READ_EIN				±10 W	±10 W ±2%
READ_IOUT				±1 A	±5% ±2%
READ_TEMPERATURE				±3°C	

## TIMING SPECIFICATIONS

ITEM	DESCRIPTION	MIN	MAX	UNITS
$T_{vout\_rise}$	Output voltage rise time for 12 V and 12 Vsb from 10% to within regulation limits. The default rise time shall be 25 ms.	10	70	ms
dV/dt (new)	Output voltage dv/dt at any point of the voltage slow start when PSU is powered ON. Applies to both 12 V and 12 Vsb.		0.5	V/msec
$T_{off\_latch}$	This is the time the PSU must stay off when being powered off with loss of DC input. Both outputs must meet this off time; 1) whenever PWOK is de-asserted for the 12 V output; 2) whenever the 12 Vsb output drops below regulation limits	500		ms
$T_{sb\_on\_delay}$	Delay from DC being applied to 12 Vsb being within regulation *1500 ms for first time startup; 2500 ms for restart cycles		1500 2500	ms
$T_{vin\_good\_high}$	Delay from input being applied to VIN_GOOD assertion		1800	ms
$T_{ac\_on\_delay}$	Delay from DC being applied to all output voltages being within regulation		3000	ms
$T_{vout\_holdup}$	Time 12 V output voltage stay within regulation after loss of DC	2.4		ms
$T_{pwok\_holdup}$	Delay from loss of DC to de-assertion of PWOK	1		ms
$T_{vin\_good\_low}$	Delay from loss of DC to de-assertion of VIN_GOOD		2	ms
$T_{pson\_off\_delay}$	Delay from PSON# de-asserted to power supply turning off		5	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 DC or the PSON signal	100		ms
$T_{sb\_vout}$	Delay from 12 Vsb being in regulation to O/Ps being in regulation at DC turn on	50	1500	ms
$T_{12VSB\_holdup}$	Time the 12 Vsb output voltage stays within regulation after loss of DC *measured at 70% load, with the standby output loaded at 1.75A	50		ms

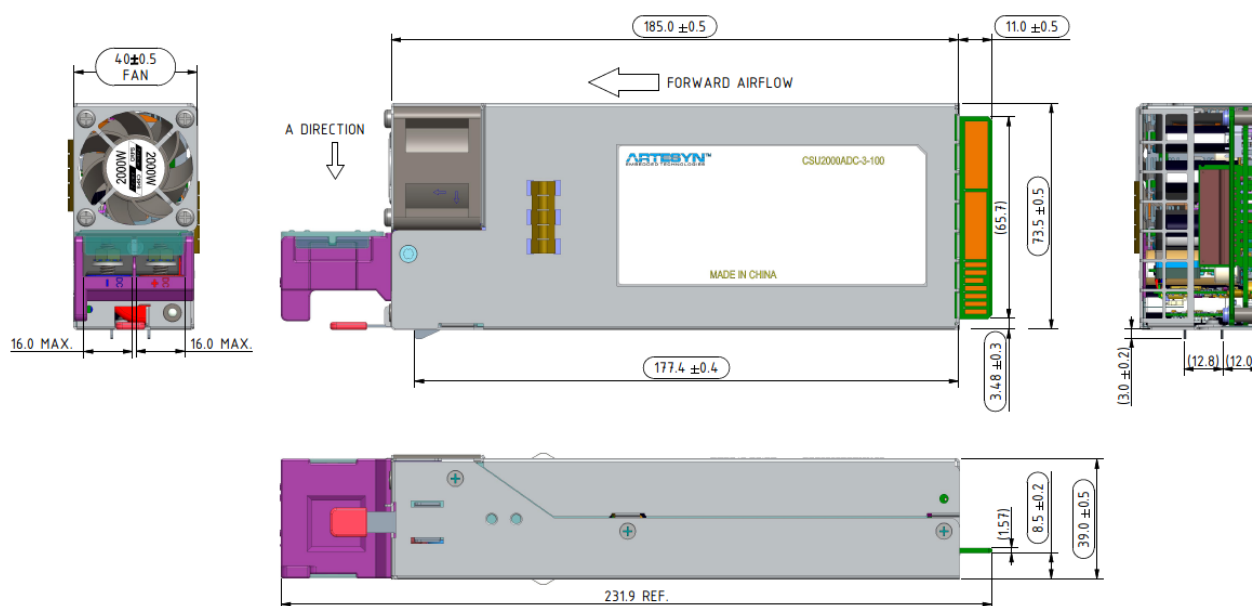
## TIMING DIAGRAM



## ENVIRONMENTAL SPECIFICATIONS

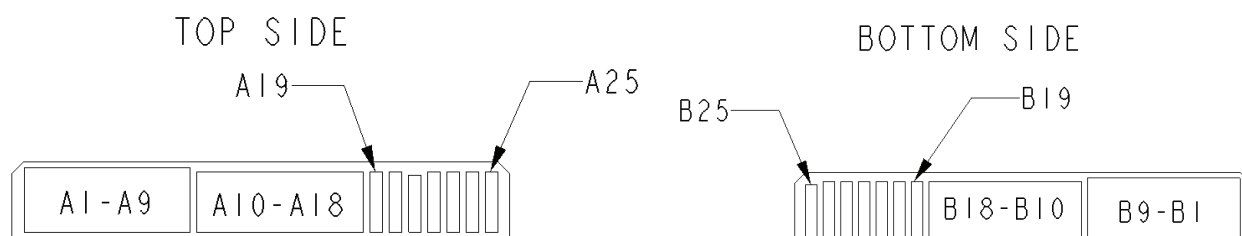
Operating temperature	0 to 55°C at full load Allowable operating temperature of 65°C at 60% load
Operating altitude	up to 5000 m
Operating humidity	+5% to +95%, non-condensing
Storage temperature	-40°C to +70°C, non-condensing
Storage humidity	+5% to +95%, non-condensing
Non-operating altitude	up to 10,000 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



Unit: mm

## 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 or any approved equivalent

Pin	Name	Pin	Name
A1	GND	B1	GND
A2	GND	B2	GND
A3	GND	B3	GND
A4	GND	B4	GND
A5	GND	B5	GND
A6	GND	B6	GND
A7	GND	B7	GND
A8	GND	B8	GND
A9	GND	B9	GND
A10	+12V	B10	+12V
A11	+12V	B11	+12V
A12	+12V	B12	+12V
A13	+12V	B13	+12V
A14	+12V	B14	+12V
A15	+12V	B15	+12V
A16	+12V	B16	+12V
A17	+12V	B17	+12V
A18	+12V	B18	+12V
A19	PMBus SDA	B19	A0 (SMBus address)
A20	PMBus SCL	B20	A1 (SMBus address)
A21	PSON	B21	12Vsb
A22	SMBAlert#	B22	Cold Redundancy Bus
A23	Return Sense	B23	12V load share bus
A24	+12V remote Sense	B24	GND
A25	PWOK	B25	VIN_GOOD

## ORDERING INFORMATION

Model number	Airflow	Nominal Output Voltage	Regulation Band	Minimum Current	Maximum Current	Output Ripple P/P	Standby
CSU2000ADC-3-100	Normal fan	12.2 Vdc	11.8 - 12.6 Vdc	1 A	163.9 A	120 mV	12.0 V @ 3.5 A
CSU2000ADC-3-101	Reverse fan	12.2 Vdc	11.8 - 12.6 Vdc	1 A	163.9 A	120 mV	12.0 V @ 3.5 A