



[ 2 YEAR WARRANTY ]



## AFE2000 SERIES

Single output

- **Approved to EN61000, IEC-1000, UL1950, CSA 22.2 No. 950-95**
- **Operating ambient temperature of 0°C to +50°C**
- **Complies with ETS300 132-1 and EN61000-3-2**
- **Hot-swap capability**
- **11.5 x 6.75 x 4.9 inch size**
- **N+1 redundancy capability**
- **Extensive features available**
- **Compatible with AFS standard shelves for configuring rack-mounted power systems**

The AFE2000 power module is a rack mountable single phase AC to DC power supply, designed to be a cost-competitive front-end power supply for distributed power systems. It is particularly suitable for use in data processing, datacom and telecom applications. The outputs are floating so the end user can ground the plus, minus or neither depending on the end use application. The AFE2000 power modules are designed for hot-swap operation and can be mounted into AFS4000/6000 power shelves for redundant-mode operation.

### SPECIFICATION All specifications are typical at nominal input, full load at 25°C unless otherwise stated

OUTPUT SPECIFICATIONS		
Output voltage	Main: 48/54.5/56.2VDC Auxiliary: 12VDC	±1.0% ±1.0%
Output power	Main Auxiliary	2000W 12W
Regulation	Line, load, IT, ageing	±3.0%
Turn-on	Output rise time Turn-on (AC applied) Turn-on (inhibit removed)	100 to 400ms 4s max. 1.5s max.
Ripple and noise (<50MHz)		480mV pk-pk
Transmission noise	100 to 3kHz	35dBnrc
Overvoltage protection		60VDC max.
Undervoltage protection	>44.5VDC <42VDC for >5s	Delivers full power Latch-off
Short circuit protection	<30s >30s	Automatic recovery Latch-off
Current sharing	Active current share (50% to 100% loading)	±10%
Remote sense		1.0V max. distribution line loss
INPUT SPECIFICATIONS		
Input voltage range	200/240VAC nom.	170 to 264VAC
Input frequency range	50/60Hz nom.	47Hz to 63Hz
Input surge current	25°C cold start	22A
Safety ground leakage current	254VAC @ 60Hz	1.5mA max. 0.5mA typ.
Input current	220VAC, 2000W	10.5A rms
Power factor		0.99 min.

EMC CHARACTERISTICS		
Conducted emissions	FCC-CFR, part 15, subpart B CISPR 22	Class B Class B
Radiated emissions	FCC-CFR, part 15, subpart B CISPR 22	(Note 7) (Note 7)
Immunity - conducted	IEC1000-6	Level 2
Immunity - radiated	IEC1000-3	Level 3
Immunity - ESD	IEC1000-2	Level 3
Line harmonics	per EN61000-3-2	Compliant
GENERAL SPECIFICATIONS		
Hold-up time (See Note 1)	150 to 170VAC 0 to 150VAC	500ms 20ms
Efficiency		86%
Isolation voltage	Input/output Input/chassis Output/chassis	3000VAC 1500VAC 100VAC
Switching frequency		200kHz
Approvals and standards		EN60950, IEC950, UL1950 CSA C22.2 No. 950
Case material		Electrolytic zinc coated CRS, ASTM A591, light beige paint
Weight		5.0kg (11lbs)
MTBF	MIL-HDBK-217E Demonstrated	150,000 hours 300,000 hours
ENVIRONMENTAL SPECIFICATIONS		
Thermal performance	Operating ambient Non-operating	0°C to +50°C -40°C to +100°C
Cooling		Forced air
Relative humidity	Operating	5% to 95% RH
Altitude	Operating	13,000 feet max.
Vibration	5Hz to 500Hz	0.75G rms peak
Shock		15G, 1/2 Sine, 11ms

## 2000 Watt AC/DC PFC front-end for distributed power architectures

OUTPUT VOLTAGE	OUTPUT CURRENT		RIPPLE	TOTAL REGULATION	REMOTE ENABLE/INHIBIT	PARALLEL INTERFACES	MODEL NUMBER
	MIN	MAX					
48VDC	0A	41.7A	480mV	±3.0%	Inhibit	All	AFE2000-26S48NA
54.5VDC	0A	36.7A	545mV	±3.0%	Inhibit	All	AFE2000-26S54NA
56.2VDC	0A	35.6A	562mV	±3.0%	Inhibit	All	AFE2000-26S56NA

### Parallel interface specifications.

All signals are referenced to ISO\_GND unless otherwise indicated.

#### Isolated signal ground (ISO\_GND)

May be connected to any voltage in the range from +Vout+5VDC to -Vout-5VDC.

#### Overtemperature (OTW)

Output bi-level signal. Bi-level signals are open-collector (drain) with a 5mA sink capability and maximum voltage stand-off of 60VDC.  
Logic 0 : Signal precedes OT shutdown by 5ms.  
Logic 1 : Normal operation.

#### Remote Inhibit (INHIBIT)

Input bi-level signals. Bi-level input signals shall be no greater than 5VDC.  
Logic 0 : Normal operation.  
Logic 1 : Output inhibit.

#### Voltage margin down (DOWN)

Input bi-level signals. Bi-level input signals shall be no greater than 5VDC.  
Logic 0 : Nominal output voltage.  
Logic 1 : 44.5 to 45.5VDC output.

#### Power good signal (PWR\_GOOD)

Output bi-level signal. Bi-level signals are open-collector (drain) with a 5mA sink capability and maximum voltage stand-off of 60VDC.  
Logic 0 : Output undervoltage.  
Logic 1 : Output voltage normal.

#### Fault fail signal (F/F ±)

Differential relay contact, isolated from all outputs and returns within the power module.  
Relay closed : Power supply failure  
Relay open : Normal operation.

#### Power fail warning signal (PFW)

Output bi-level signal. Bi-level signals are open-collector (drain) with a 5mA sink capability and maximum voltage stand-off of 60VDC.  
Logic 0 : Signal precedes loss of output power by 5ms.  
Logic 1 : Normal operation.

#### Module Missing Pin (MM)

Provision for detection of unseated or removed module. MM pins are common internal to the power supply. Internal pull-up resistor to +5VDC logic bias, referenced to RS-.

#### Auxiliary Output (AUX ±)

12VDC auxiliary output. Isolated from both the main output and the isolated signal ground. May be utilized for external housekeeping supply and connected to either main output or isolated signal ground.

#### Current Monitor (IMON)

Current source which mirrors magnitude of the output current. Signal return is referenced to RS-.

#### Current Limit (CL)

Output bi-level signal. Bi-level output signal is open-collector (drain) with a 5mA sink capability and maximum voltage stand-off of 60VDC.  
Logic 0 : Output is in current mode control and is current limiting.  
Logic 1 : Normal operation.

#### Remote Enable (ENABLE)

Input bi-level signal. Bi-level input signal shall be no greater than 5VDC.  
Logic 0 : Output inhibited.  
Logic 1 : Normal operation.

#### Reset (RESET)

Input bi-level signal. Bi-level input signal shall be no greater than 5VDC.  
Logic 0 : Resets fault indicators without unit shut-down.  
Logic 1 : Normal operation.

#### AC Good (AC OK)

Output bi-level signal. Bi-level output signal is open-collector (drain) with a 5mA sink capability and maximum voltage stand-off of 60VDC.  
Logic 0 : AC input below normal operating range.  
Logic 1 : AC input within steady-state operating range (170 to 264VAC).

#### Voltage monitoring (VMARG)

Input analog signal referenced to RS-. Adjusts output up to 4VDC higher than the nominal set point.

### Features

#### Live insertion and removal

OR-ing diodes provided on output.

#### Voltage monitoring jacks

Located on front panel.

#### LED's (located on front panel)

Power Good - Green  
Power Fail - Red  
AC Good - Green

#### Protection

Thermal protection - automatic shut-off for fan failure or internal overtemperature.

Output Overload and Short Circuit - automatic shut-down after 30 seconds. Current regulated output down to less than 1VDC.

Output Overvoltage - automatic shut-down for both main (60VDC max.) and auxiliary (15.6VDC max.) outputs.

Output Undervoltage - automatic shut-down below 42VDC.

#### Current Share

Active current sharing for up to 9 AFE2000 power modules.

#### Short Pin

Short pin located in the output connector initiates shut-down of the power supply output when the power supply is removed from the host power shelf.

### International Safety Standard Approvals



EN60950/IEC950 File No. E9972397



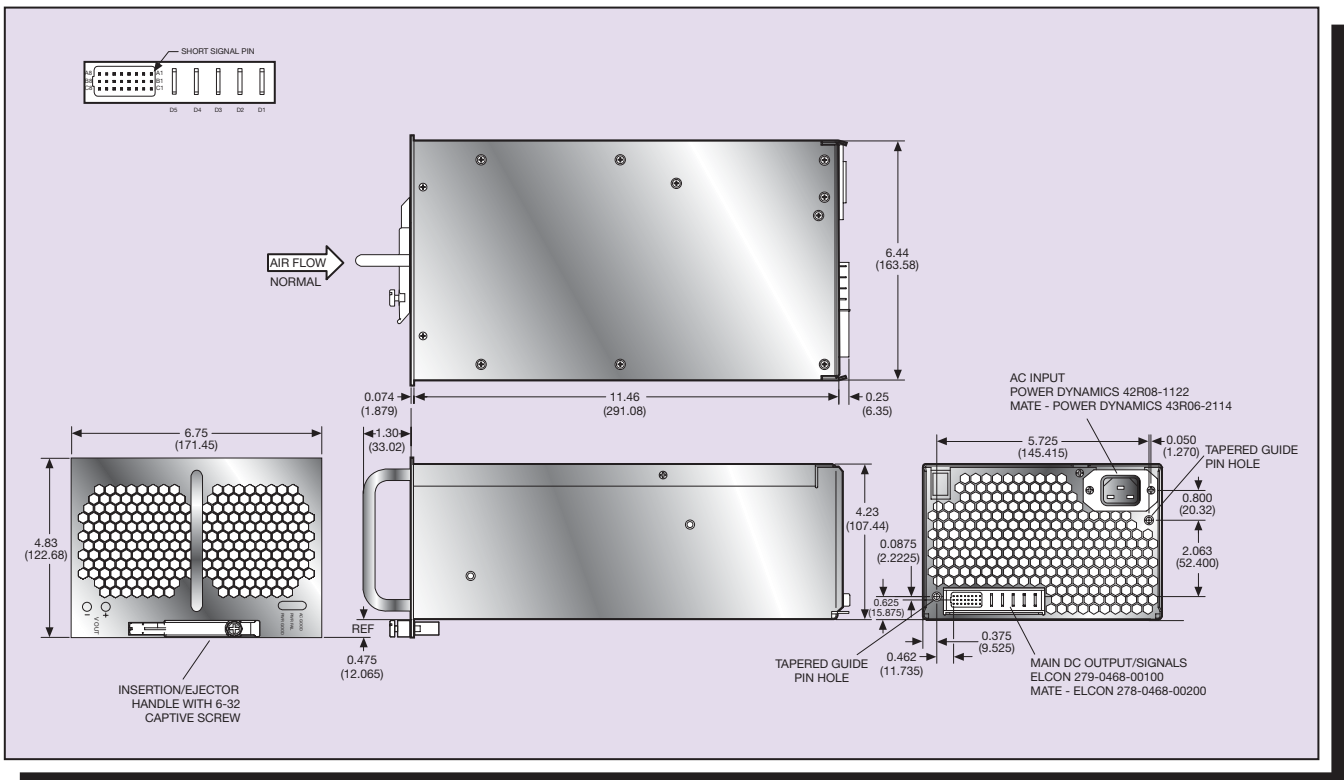
UL1950 File No. E135734

# 2000 Watt AC/DC PFC front-end for distributed power architectures

PIN CONNECTIONS							
PIN NO.	FUNCTION	PIN NO.	FUNCTION	PIN NO.	FUNCTION	PIN NO.	FUNCTION
A1	Short Pin	B1	DOWN	C1	RS+	D1	+Vout
A2	AUX+	B2	VMARG	C2	RS-	D2	+Vout
A3	AUX-	B3	MM	C3	MM	D3	PWR RTN
A4	RS-	B4	I SHR	C4	F/F-	D4	PWR RTN
A5	Not Used	B5	RESET	C5	F/F+	D5	CGND <sup>(2)</sup>
A6	Not Used	B6	IMON	C6	INHIBIT/ENABLE		
A7	AC OK	B7	Power Good	C7	CL		
A8	PFW	B8	ISO GND <sup>(3)</sup>	C8	OTW		

**Notes**

- 1 PFW signal warning issued 5 msec prior to shutdown.
- 2 Chassis or safety ground.
- 3 Isolated signal ground.
- 4 Output ground - referenced to RS-.
- 5 Refer to Application Note 106 for installation of the AFE2000 power modules into the AFS4000 power shelf.
- 6 Refer to Application Note 110 for description of outputs and signals available with AFE2000 power modules installed in Artesyn standard front-end power shelf.
- 7 Class A for power module, Class B when installed in AFS4000 shelf (subject to cable/system configuration).
- 8 NOTICE: Some models do not support all options. Please contact your local Artesyn representative or use the on-line model number search tool at <http://www.artesyn.com/powergroup/products.htm> to find a suitable alternative.



**(J2) DC connector**  
Elcon 279-0468-00100 or equivalent.

**(J1) AC connector**  
Power Dynamics 42R08-1122 or equivalent.

**(J2) DC mating connector**  
Elcon 278-0468-00200 or equivalent.

**(J1) AC mating connector**  
Power Dynamics 43R06-2114 or equivalent.