



# A0750 AC-DC POWER MODULE

AC Input: 85V to 264V, Single DC Output: 24V to 28V, 750W

## FEATURES

- ❑ High power density, 7.7W / in<sup>3</sup>
- ❑ Net Weight: < 2.2 KG
- ❑ Low profile : 40.8mm (fit 1U 19" shelf – R2250 series)
- ❑ Efficiency: 77% ~ 86 % typical
- ❑ Power factor correction (meet IEC1000-3-2 requirements)
- ❑ Overvoltage & overcurrent protection
- ❑ Overtemperature warning & protection
- ❑ Redundant parallel operation -up to 12 units.
- ❑ Remote On/Off and Remote sense
- ❑ Active load sharing
- ❑ Hot insertion/removal (Hot Swap)
- ❑ Power fail warning and fault alarm
- ❑ Low start-up temperature: - 30°C
- ❑ I<sup>2</sup>C for voltage, current, temperature report & Power Supply ID.
- ❑ Front panel LED indicators
- ❑ 400Hz input available (with wattage derating)
- ❑ Meet UL60950, EN60950 and CE mark requirements.

The Powerstax A0750 series of front-ends power modules is specifically designed to operate as an integral part of a complete distributed power system, with or without battery backup.

A full complement of protection, alarm and control features has been incorporated into the power unit to provide the versatility of applications.

When up to 3 x A0750 are used with the 1U high R2250 19" rack, a total 2,250W (or 1,500W of N+1) of 24VDC or 28VDC output can provide a low profile, flexible and scalable solution.

The flexible feature set makes this front-end power module an excellent choice for applications requiring modular AC-to-DC power systems such as distributed power and DC UPS.

## Applications

- ✓ Advanced workstations
- ✓ Telecom / Datacom equipment
- ✓ Midrange computers
- ✓ Mainframes
- ✓ File servers
- ✓ LAN/WAN applications
- ✓ Mass storage



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**Product Specification****Input Specification**

Parameter	Min	Typ	Max	Unit	Condition
Input voltage	85	-	264	Vac	
Input Frequency	47	-	63	Hz	400Hz available with safety approvals. Consult APC for details
Inrush Current (peak)	-	-	50	A	≥ 50% of full load
Power Factor	0.95	0.99	-	-	
Inoutr Leakage Current	-	-	1.7	mA	264Vac, 50Hz
Lighting Surge & Transients (damage free operation)	-	-	-	-	1) IEC1000-4-5 Level 3 2) IEC1000-4-4 Level 3
Hold Up Time	20	-	-	mS	At 24V, 600W
EMC (conducted)	-	-	-	-	CISPR22 Class B, EN55022 Class B, with 3dB margin

**Line Harmonics**

Active power factor correction circuitry ensures that this power supply meets requirements of IEC 1000-3-2

**Efficiency and Power Factor vs. Input Voltage at full load**

Input voltage	Efficiency (Typical)	Power Factor (Typical)
90Vac	83%	0.99
100Vac	84%	0.99
120Vac	85%	0.99
160Vac	85%	0.98
190Vac	86%	0.98
220Vac	86%	0.98
240Vac	87%	0.98
264Vac	88%	0.98

**Notes:**

When using this table to calculate line cord requirements, allow, at a minimum, an extra 3% for variations between units. Actual measured results will depend upon the harmonic content of the input voltage waveform.

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**Product Specification****Output Specification**

Parameter	Min	Typ	Max	Unit	Note
Vo set point:					
Powerstax A0750	-	24.0	-	Vdc	
	-	28.0	-		
Regulation (line, load, temperature & set point)	-2.0	-	2.0	%	Measured at remote sense
Remote-sense Drop	-	-	0.5	Vdc	
Io (rated)					
Powerstax A0750 (24Vo)	0	-	31.25	Adc	750W maximum
Powerstax A0750 (28Vo)	0	-	26.78		750W maximum
Ripple (20MHz bandwidth)	-	-	150	mVp-p	Under any load conditions
Noise (20MHz bandwidth)			300	mVp-p	
Transmission Noise (C message)	-	-	45	dBrc	
Output Rise Time	10	-	100	mS	Rise from 10% to 90% of final output level (resistive load)
Overvoltage Protection	29	-	32	Vdc	Reset by cycling ac input, On/Off, or reinsertion
Output Current Limit (Steady state)	-	-	40A	Adc	
Transient Response					25% step load transient with slew rate 0.1A/us within the range from 25% to 75% of full load.
Voltage Range	-2.0	-	2.0	%	
Active Current Sharing Differential	-	-	±3.2	A	Single-wire current share at full load
Efficiency	80	81	-	%	At full load, 120Vac with Oring diode
	83.5	84	-	%	At full load, 264 Vac with Oring diode
Reserve Output Current Protection	-	-	-	-	Oring diode
Start-Up delay	-	1.3	2	s	Measured from application of valid ac voltage
Turn-On delay	-	-	250	ms	Measured from DC on/off

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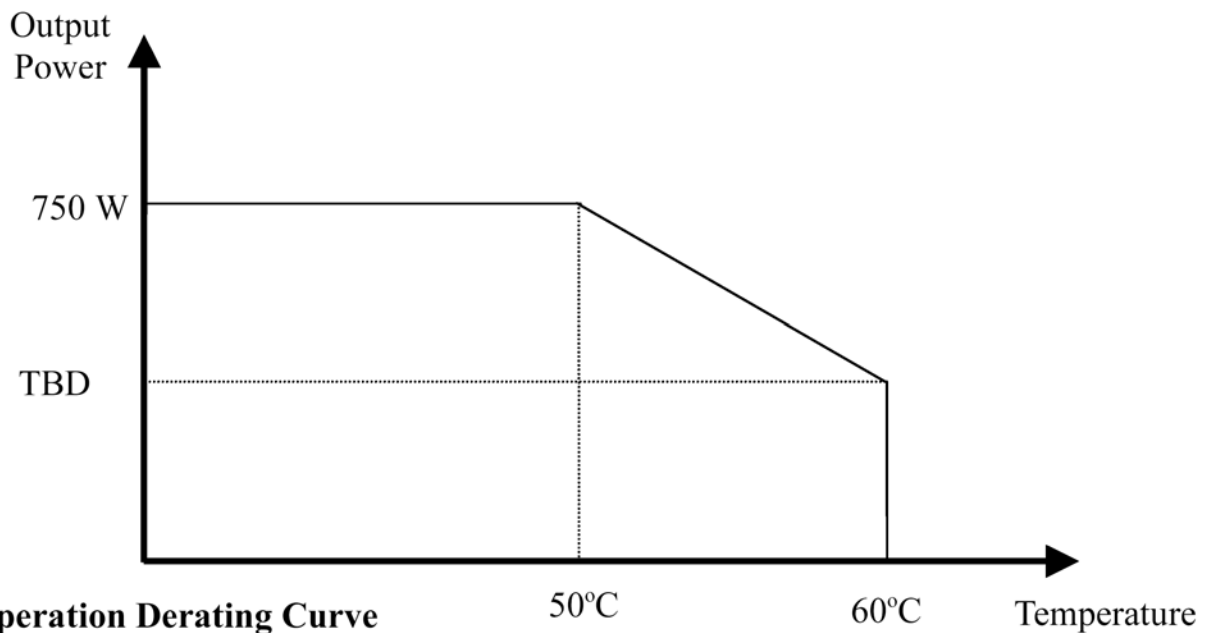
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## Product Specification



### Environmental Characteristics

Parameter	Min	Typ	Max	Unit	Note
Storage Temperature	-40	-	85	°C	
Operating Temperature (note 1)	0	-	60	°C	Derating (TBD)
Acoustics	-	47	52	dB(A)	ISO 7779 SPL
Humidity (non-condensing)	5	-	95	%	
Altitude	-200	-	13,000	Feet	Derated at 2°C/1000 ft. above 8000 ft.
ESD	-	-	-	-	IEC1000-4-2 Level 3 stand-alone
Isolation Voltage	3,000VAC				Primary to Secondary
	1,500VAC				Primary to chassis GND
	500VAC				Secondary to chassis GND
MTBF	$4 \times 10^5$	-	-	hours	@110V Input 80% load, $T_A = 30^\circ\text{C}$
Vibration					Meet IEC68-2-6
Shock					Meet IEC68-2-36
Weight	-	2.2	-	Kg	



Note 1 : Operation Derating Curve





**SMBus Function**

Function	Command Code	Protocol*1			Unit
Temperature	0x08	Read	Word	No PEC	° K
Voltage	0x09	Read	Word	No PEC	mV
Current	0x0A	Read	Word	No PEC	mA
Manufacture Date*2	0x1B	Read	Word	No PEC	
Serial number	0x22	Read	Word	No PEC	
Manufacturer Name	0x20	Read	Block*3	No PEC	
Device Name	0x21	Read	Block*3	No PEC	
Manufacture Data (Version)	0x23	Read	Block*3	No PEC	

1. Reference: System management bus specification v1.1

2.The date is packed in the following fashion:

$(\text{Year} - 1980) * 512 + \text{Month} * 32 + \text{Day} = \text{data byte high: data byte low}$

Field	Data byte	Allow value
Day	Bit 0~4	1 - 31 (corresponds to date)
Month	Bit 5~8	1 - 12 (corresponds to month number)
Year	Bit 9~15	0 - 127 (corresponds to year biased by 1980)

Example: 2001/11/29 = 10101101111101 (bin) = 2B7D (hex)  
 Where 2B(hex) is data byte high, 7D(hex) is data byte low.

3.Read block data byte 1~N is in ASCII code, where N is the value of byte count.

**Address Definition**

RACK	Shelf	P.S. No.	Address	A3	A2	A1	A0
	1	1	0x00	0	0	0	0
		2	0x02	0	0	0	1
		3	0x04	0	0	1	0
	2	4	0x20	0	1	0	0
		5	0x22	0	1	0	1
		6	0x24	0	1	1	0
	3	7	0x40	1	0	0	0
		8	0x42	1	0	0	1
		9	0x44	1	0	1	0
	4	10	0x10	1	1	0	0
		11	0x12	1	1	0	1
		12	0x14	1	1	1	0

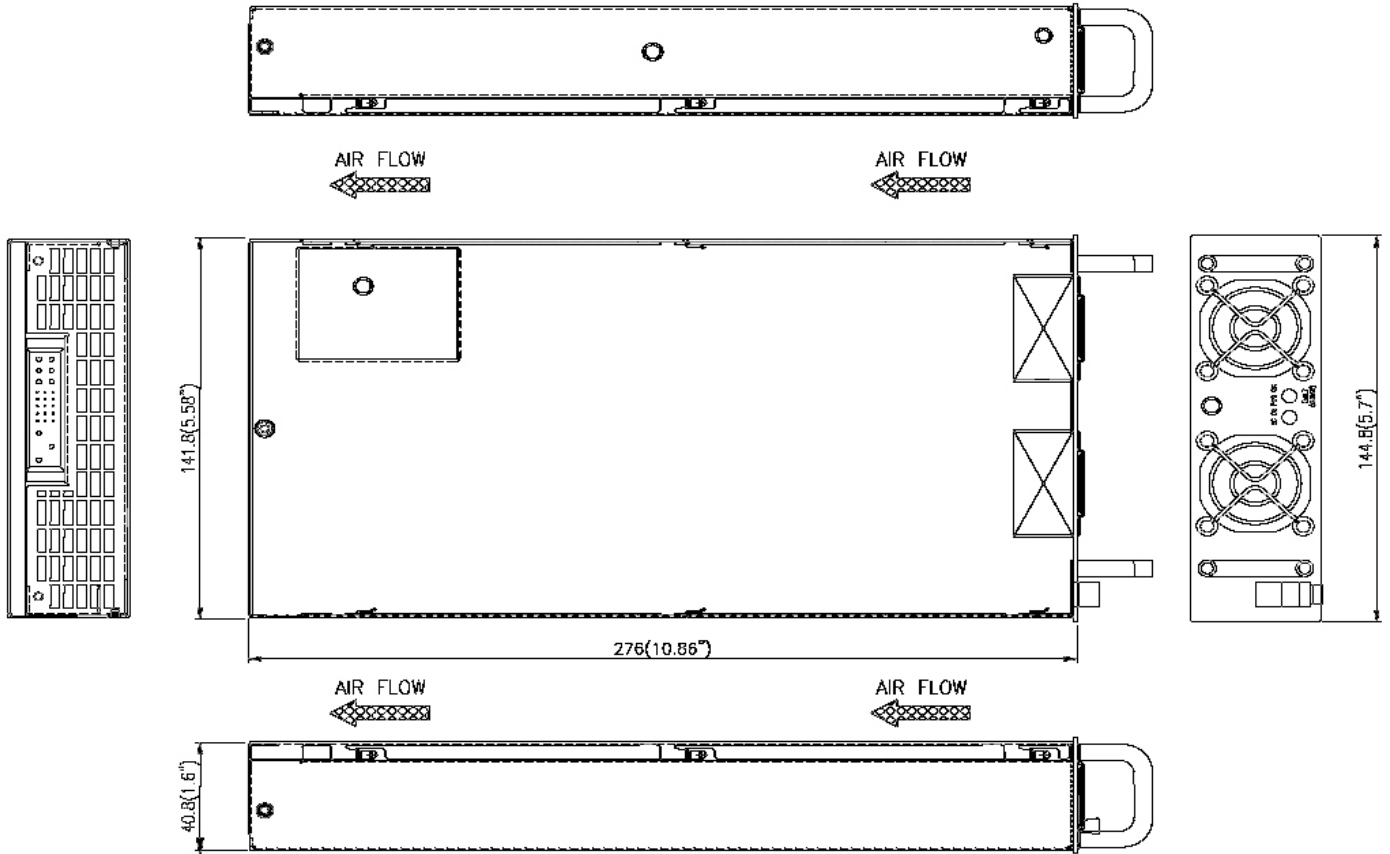
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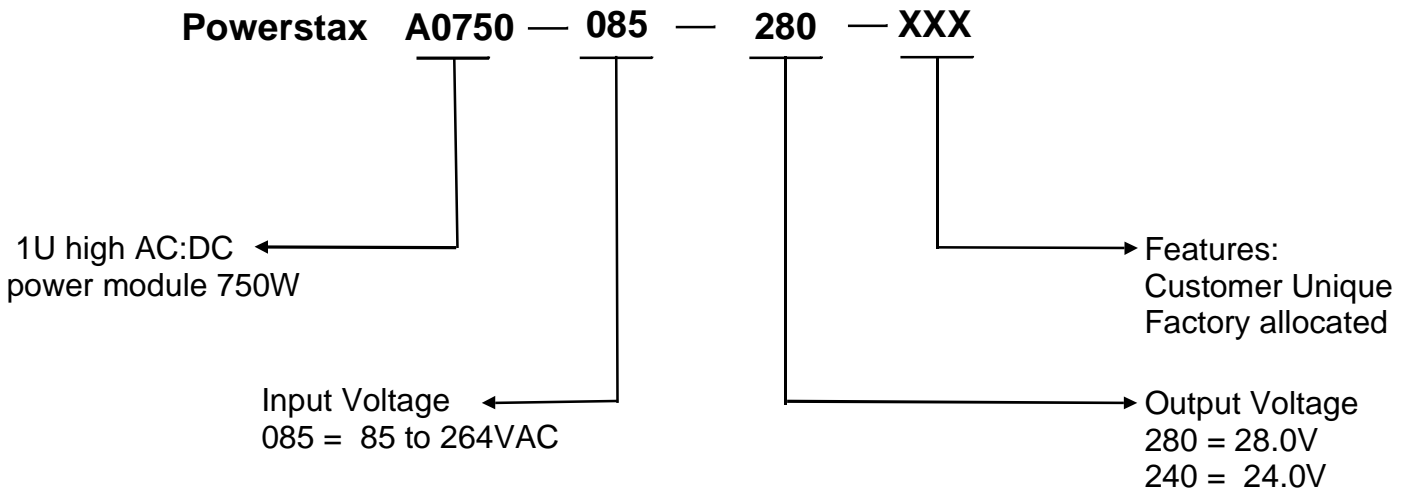
## Product Specification



### Mechanical Outline



### Model Reference Guide





## Definition of Terms

### AC Line Discrimination

The unit senses the input line range at power up and shuts the unit down if the input drops below the line range for a specified period of time.

### Current Monitor

The output current could be reported through the I2C bus.

### Front Panel LEDs

**LED 1** -- AC OK (green): Input voltage OK

**LED 2** -- Output OK (green): The unit is powered up and operating normally

or

Output fail (amber): The unit has detected an internal fault.

### Input Overcurrent Protection

An internal fuse is provided for input protection in compliance with safety agency requirements.

### Current Share Bus (CS)

A single-wire interface between each of the power units forces them to share the load current equally.

### Overcurrent Protection

In the event of an overload condition, the power supply limits the output current.

### Overvoltage Protection

The power unit turns itself off before the output voltage reaches the OVP threshold.

### I<sup>2</sup>C Serial Bus Interface support

The power unit provides I<sup>2</sup>C serial bus interface to receive/transmit data

**SCL:** Clock signal input for I<sup>2</sup>C functionality.

**SDA:** Data signal I/O for I<sup>2</sup>C functionality.

**A0~A3:** Address pin for I<sup>2</sup>C address Bit 0~3.

### ORing Diode

A diode at the output of the power unit protects the DC bus during a power supply failure or hot plugging of the power unit.

### Overtemperature Protection

In the event of an overtemperature condition, the power unit protects itself by shutting off, restarts automatically after cooling down.

### Remote Sense ( RS+, RS-)

These signals permit the power units to compensate for a voltage drop across the output distribution.

### On/Off

This is an input signal referenced to the negative output. Shorting this signal to the negative output will turn on the power unit.

### Status Signals

The following are the optically isolated open-collector signals:

**DC FAIL:** This signal indicates the output fail. It becomes low with a turn on delay of 100 to 500mS after the output voltage reaches in the regulation window. It will go to a high level at least 1mS before output voltage runs out of regulation window.

**OTP:** This signal indicates fan fail or over temperature. It becomes low with a turn on delay of 100 to 500mS after the output voltage reaches in the regulation window. It will go to a high level 200mS before the unit shuts down if a fan fail or over temperature is sensed.

The logic low level is lower than 0.6V with the sink current of the photo-transistor less than 1mA.

### INT. bus

Intermediate DC bus. It is a DC output from the power module for shelf internal usage. There is a reserved slot for a DC-DC converter on the back plane of the power shelf. The DC-DC may transfer DC bus voltage to a standby DC output that may be customized upon request.