Model: BPA-PFS1500

AC/DC Power Series for Industrial/Medical Application

Highlight

- Low cost
- 1500W max continuous output
- 90V-264Vac universal input range
- 5”x8”x1.58” compact size
- -20℃-70℃ operation temperature range
- Build-in active PFC
- Intelligent fan speed control
- DC_OK analog indication signal
- Remote sense, Remote ON/OFF control
- Active current sharing support
- 5000m operation altitude
- Medical grade 2xMOPP isolation
- Meet Semi F47-0706
- 5V/2A standby
- Support semi-custom design

RoHS

Typical Application

- Medical IVD, Image equipment
- Industrial automation production line
- Robot and Motor control
- Semiconductor manufacture

Product Overview

The **BPA-PFS1500** is a highly reliable, compact, 1500W, AC to DC, single output power supply module. With a full range input of 90-264VAC, this power supply module achieves the highest performance and efficiency by incorporating digital control technology. The BPA-PFS1500 family also includes CANBus interface to monitor and control all essential functions of the power supply module.

Custom controls available.

Key Specification

Model	BPA-PFS1500T12	BPA-PFS1500T15	BPA-PFS1500T18	BPA-PFS1500T24	BPA-PFS1500T28	
Output voltage	12V	15V	18V	24V	28V	
Rated Current	0-125A	0-100A	0-83.4A	0-62.5A	0-53.6A	
Model	BPA-PFS1500T36	BPA-PFS1500T42	BPA-PFS1500T48	BPA-PFS1500T60	BPA-PFS1500T72	BPA-PFS1500T100
Output voltage	36V	42V	48V	60V	72V	100V
Rated Current	0-41.7A	0-35.8A	0-31.3A	0-25A	0-20.9A	0-15A
Rated Power	1500W					
Dimension	5"x8"x1.58" or 127mmx203mmx40mm					
EMC	Class B Emissions. Compliance with IEC60601-1-2 4th edition					

Ordering Model Name

BPA-P	F	S	1500	T	24	
Series Name	Package Type	Outputs	Rated Power	Connector Type	Output Voltage	Control Code
	F: Force air cooling enclosed	S: Single output	1500W	T: Screw terminal		AA: Default for Standard model

For any custom design please contact BluTek Power, Inc.

Phone: (973) 594-1800
Salesteam@BluTekPower.com

Model: BPA-PFS1500

Input Specification

Function	Minimum	Typical	Maximum	Condition
Rated Input Voltage	100Vac		240Vac	
Input Voltage Range	90Vac		264Vac	
Input Frequency	47Hz	50 / 60Hz	63Hz	
Input Current			18A	With rated input voltage
Power Factor	0.95			With max rated output power
Peak Efficiency (exclude fan power)			93.5%	12V model @ 230Vac
			93.5%	24V model @ 230Vac
			94%	36V model @ 230Vac
			94%	48V model @ 230Vac
Inrush Current			40A	240Vac
Input surge voltage			300Vac	last for 1second

Output Specification

Function	Minimum	Typical	Maximum	Condition
Output Voltage Trim Range	12V	12V	12.5V	12V Model
	15V	15V	15.5V	15V Model
	17.5V	18V	18.5V	18V Model
	24V	24V	26V	24V Model
	26V	28V	28V	28V Model
	32.4V	36V	38V	36V Model
	37.8V	42V	46.4V	42V Model
	42V	48V	54V	48V Model
	54V	60V	66V	60V Model
	65V	72V	79V	72V Model
	90V	100V	110V	100V Model
Output Power	0W		1500W	
Initial Tolerance			±0.5%	Trim in factory
Total Regulation			3%	Include line and load regulation
Output Ripple			1%	Peak-Peak value, full load measure at board end with 0.1uF Ceramic and 47uF electrolytic capacitor, 20MHz BW
Dynamic Response			5%	with 50% load step
Constant current trim range	15A		31.35A	For 48V Charger model only, Contact BluTek Power, Inc. for custom design
Capacitive Load				No special requirement
Power up time			2s	
Rise time			50ms	without cap load
Hold up time	10ms			115Vac/60Hz input @ 1200W load

Protection Specification

Function	Minimum	Typical	Maximum	Condition
Input under voltage		80Vac		Auto-restart after fault is removed
Over current protection (OCP)				Auto-restart, Clamp by constant current
Short circuit protection (SCP)				Auto-restart after fault is removed
Over voltage protection (OVP)			130%	Latch off
Over temperature protection (OTP)				Latch off

**Protection mode latch or auto-restart can be customized, contact BluTek Power, Inc. for more details.*

Standby Output Specification

Function	Minimum	Typical	Maximum	Condition
Output voltage	4.75V	5V	5.25V	
Over current protection (OCP)	2.5A			Auto-restart after fault is removed
Short circuit protection (SCP)				Auto-restart after fault is removed

Phone: (973) 594-1800
Salesteam@BluTekPower.com

Reliability

Function	Minimum	Typical	Maximum	Condition
MTBF	500Khrs			According to Telecordia SR-332. 115Vac 25℃ ambient with rated load
Life	5 years			Rated nominal conditions

EMC

Conducted Emissions	EN 55011 / EN 55032,Class B
Radiated Emissions	EN 55011 / EN 55032,Class B
Harmonic Current Emissions	IEC 61000-3-2 Meet Class A limit
Voltage Flicker	IEC 61000-3-3
Electrostatic Discharge	IEC 61000-4-2 Level 4 (Air Discharge: 15 kV,Contact Discharge: 8 kV) Criteria A
Radiated Field	IEC 61000-4-3 Criteria A
Electrical Fast Transient / Burst	IEC 61000-4-4 Level 3 (2 kV),Criteria A
Surge	IEC 61000-4-5 Level 3 (Common Mode 2kV, Differential Mode 1kV), Criteria A
CS	IEC 61000-4-6 Level 2 (150 kHz-80 MHz, 3 Vrms, 6 Vrms at ISM bands and Amateur radio bands), Criteria A
Power Frequency Magnetic Fields	IEC 61000-4-8 Criteria A,Magnetic field strength 30 A/m
Voltage Dips	IEC 61000-4-11 30% 10 ms Criteria A 60% 100 ms Criteria B 100% 5000 ms Criteria B
Voltage Dips	IEC 60601-1-2 Criteria A @ 1000 W or lower 0% UT, 0.5 cycle(10 ms) (0°,45°,90°,135°,180°,225°,270°,315°,360°) Criteria B ,can meet Criteria A with 700 W or lower load 0% UT,1 cycle (20 ms), 0° Criteria B 70% UT,25 cycle (500 ms) , 0° Criteria B 0% UT,250 cycle (5000 ms) , 0°

Criteria A: Normal operation within spec limit
Criteria B: Out of regulation or restart to normal operation after test

Safety / Directives

Medical Safety *		IEC 60601-1 2nd and 3rd+A1 edition TUV EN 60601-1:2006 UL 60601-1+CAN/CSA 60601-1: (Ed.3.2005)
ITE Safety *		IEC 60950-1, IEC 62368-1 TUV EN60950-1 UL 60950-1+CAN/CSA 60950-1 UL 62368-1+CAN/CSA 62368-1 GB 4943.1-2011, GB 9254-2008, GB 17625.1-2012
CE *		EMC Directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN 60601-1: 2006 + A11: 2011 + A1: 2013 + A12: 2014 & EN 60601-1-2: 2015
UKCA *		In conformance with Electrical Equipment (Safety) Regulations 2016, and Electromagnetic Compatibility Regulations 2016, Medical Devices Regulations 2002 (UK MDR 2002)
Dielectric Voltage	Input to/Output	4000Vac (2XMOPP)
	Input to/Ground	1500Vac (1XMOPP)
	Output to/Ground	1500Vac (1XMOPP)

**Compliance only, contact BluTek Power, Inc. for detailed safety certifications*

Phone: (973) 594-1800
Salesteam@BluTekPower.com

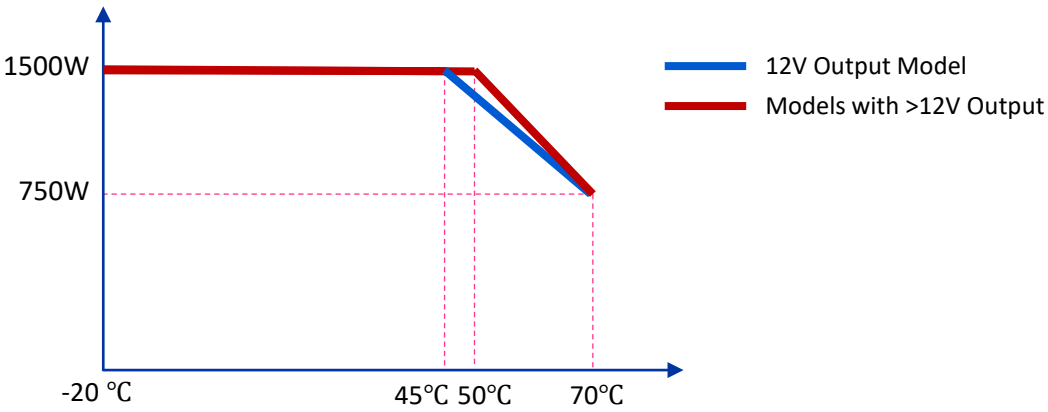
Environmental

Function	Min	Typical	Max	Condition
Operation Temperature	-20℃		70℃	See power derating curve
Operation Humidity	10%		90%	Non-condensing
Storage Temperature	-40℃		70℃	
Storage Humidity	10%RH		90%RH	Non-condensing
Operation Altitude			5000m or 16,405 feet	
Fan Acoustic Noise			45dB	80% Load, 1m distance, room temperature, test set up ISO-7779
Shock			196m/s2	With Package
Vibration			19.6m/s2	10-55Hz (1 min sweep). 1 Hour for each axis. With package

Leakage Current

Function	Min	Typical	Max	Condition
Input-PE Leakage			300uA	264Vac/50Hz Normal Condition
			1mA	264Vac/50Hz Single Fault Condition
Output-PE Leakage (Meet Type BF application for IEC60601-1)			100uA	264Vac/50Hz Normal Condition
			500uA	264Vac/50Hz Single Fault Condition

Output Power De-rating Curve



Power Derating Curve

Phone: (973) 594-1800
Salesteam@BluTekPower.com

Connector and Pin Assignment

Position	Connector / Connection	
Input Connector J1	M4 screw type terminal connector	
	Enclosure Mark	**Designation**
	L	Line
	N	Neutral
	⏚	Earth Ground

Position	Connector / Connection	
Main Output Connector J2	Output terminal blocks, with M4x8 screw and plastic spacer	
	Enclosure Mark	**Designation**
	Vo+	Output positive
	Vo-	Output return

Position	Connector / Connection	
Control Connector J3	Mating with CJT connector A2008H-2X5P or equivalent	
	Pin#	**Description**
	1	Reserve No Connection
	2	Reserve No Connection
	3	Standby_5V
	4	Standby_5V
	5	Output return
	6	Output return
	7	Remote sense+
	8	Remote sense-
	9	Current share
	10	Output return

Position	Connector / Connection	
Control Connector J4	Mating with CJT connector A2008H-2X5P or equivalent	
	Pin#	**Description**
	1	Isolated 5V+
	2	Isolated 5V-
	3	SDA
	4	SCL
	5	Reserve No Connection
	6	Reserve No Connection
	7	Remote ON/OFF-
	8	Remote ON/OFF+
	9	DC_OK-
	10	DC_OK+

Phone: (973) 594-1800
Salesteam@BluTekPower.com

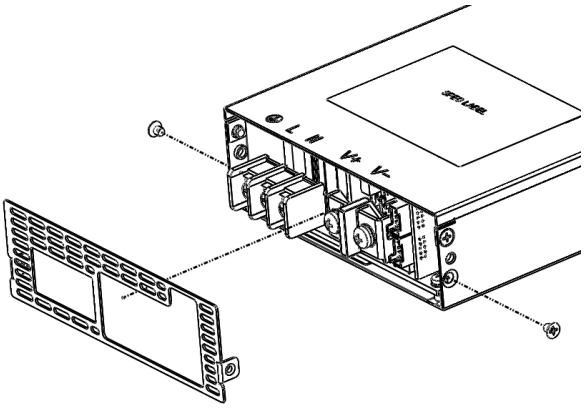
Control Features Description

	Pin#	Description	Feature Description
Control Connector J3	1	Reserve No Connection	No connection, leave open.
	2	Reserve No Connection	No connection, leave open.
	3	Standby_5V	Standby 5V output positive, 2A output capability.
	4	Standby_5V	Standby 5V output positive, 2A output capability.
	5	Output return	Standby 5V output GND (not isolated to main output GND)
	6	Output return	Standby 5V output GND (not isolated to main output GND)
	7	Remote sense+	Connect these two pins to the output sensing positive/negative point to compensate the voltage drop on output wires, refer to detailed feature description.
	8	Remote sense-	
	9	Current share	For parallel operation, each control pin of parallelled units shall be shorted together to achieve parallel and current share feature
	10	Output return	Main output GND return

	Pin#	Description	Feature Description
Control Connector J4	1	Isolated 5V+	5V control supply for communication port, it is isolated from the main output, and can only be used as control purpose, this output has no power output capability.
	2	Isolated 5V-	
	3	SDA	PMbus/I²C communication ports
	4	SCL	
	5	Reserve No Connection	No connection, leave open.
	6	Reserve No Connection	No connection, leave open.
	7	Remote ON/OFF-	These two pins are used as input signal to turn on or turn off the PSU main output, refer to detailed feature description, leave the pins open will turn on the PSU as default.
	8	Remote ON/OFF+	
	9	DC_OK-	DC_OK indication signal pins, these two pins provide DC_OK output signal to system side, refer to detailed feature description.
	10	DC_OK+	

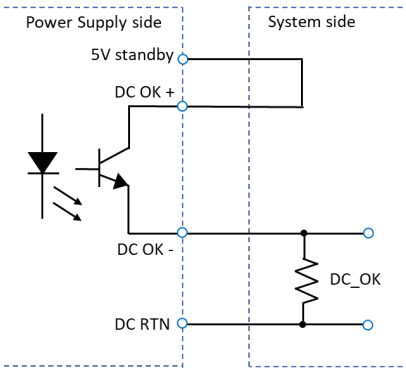
Phone: (973) 594-1800
Salesteam@BluTekPower.com

Optional Rear Panel



DC_OK Signal

DC_OK Signal is designed to indicate the main DC output status. When DC output is present, DC_OK Signal (Shown in below figure) generated will be high. When DC output is off, the internal transistor will be turned off. When AC input is off, there will be a minimum of 5 milliseconds between the time the DC_OK internal transistor turns off, and the time when the output reaches 90% of its rated value.

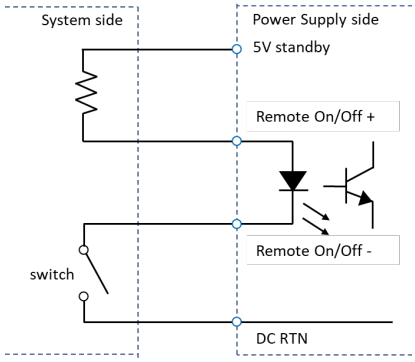


Remote Sense

Remote sense feature can be used to compensate for the extra voltage drop on output wires that are connected from the main output terminals, to the load. With wires connected from the remote sense pins, at the same locations as the wires from the main output, the remote sense function can compensate up to 500mV voltage drop.

Remote ON/OFF

Remote ON/OFF input can be used to turn off or turn on the power supply main output
The output ON/OFF can be controlled by conducting an isolated diode located within the power supply. When the main output is disabled, the +5 V Standby output will continue to operate. System can use a switch to conduct through this diode (suggested pull up resistor to 5 V standby with 1 Kohm resistor) to disable the main out. The signal can be floated (no connection to the signal), in order to enable the main output.



Voltage Trimming

The power supply provides a potentiometer for user to adjust the output voltage. Switch the potentiometer clockwise to increase the output voltage, switch the potentiometer counterclockwise to decrease the output voltage.
Please reference to Output Specification for the output voltage range which user shall trim the voltage within.
When the output is adjusted below nominal value, the maximum output current is the same as the nominal output, when the output is adjusted above nominal value, the output power cannot exceed the nominal maximum power (the maximum output current used should be reduced accordingly).

I^2C Communication

Isolated I2C communication comply with PMBus protocol. Please contact BluTek Power, Inc. for communication specification.

Current Sharing

BPA-PFS1500T series supports current sharing function. Please contact BluTek Power, Inc. for detail.

Phone: (973) 594-1800
Salesteam@BluTekPower.com

Mechanical Drawing

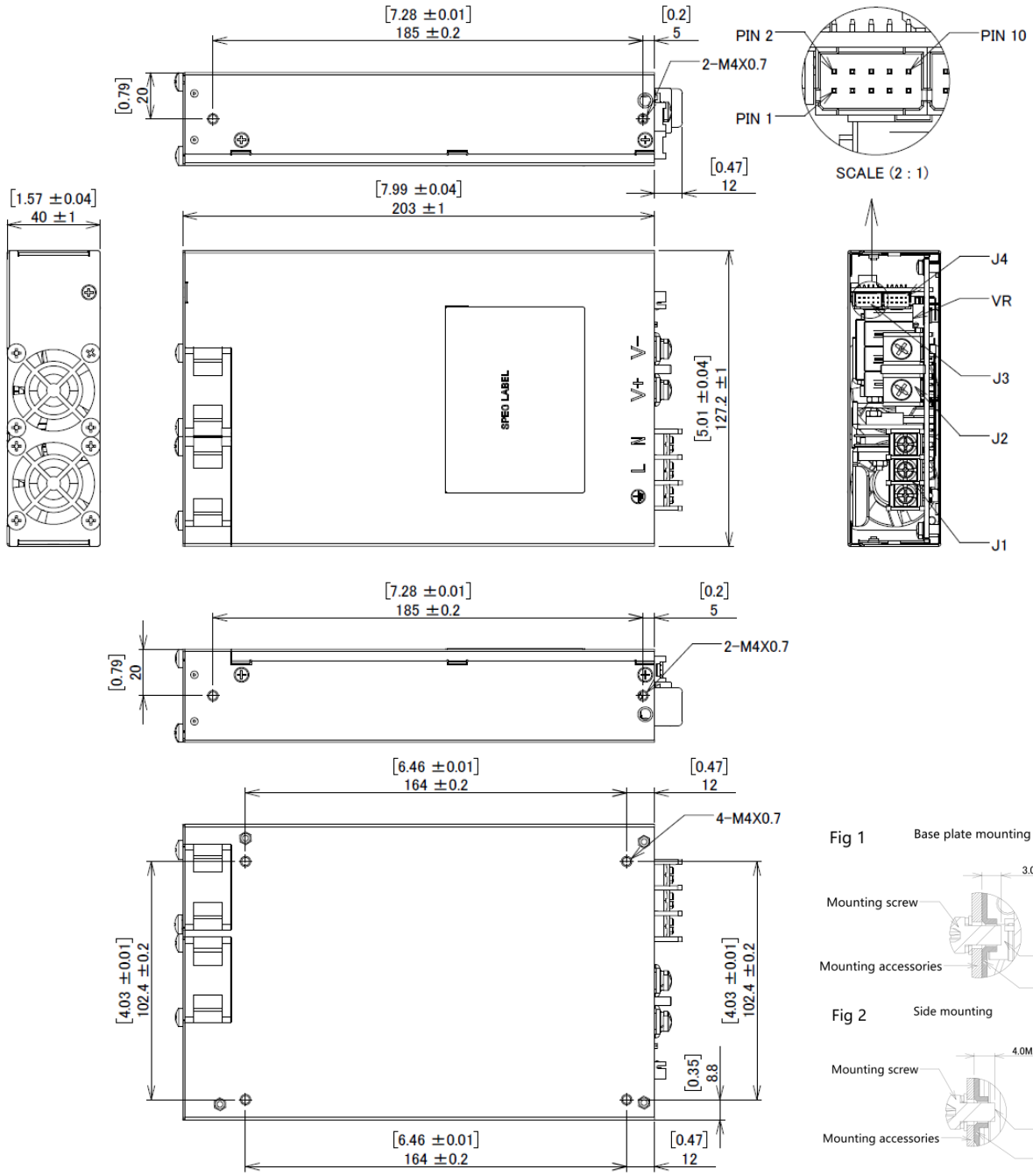


Fig 1 Base plate mounting

Fig 2 Side mounting

Notes:

1. Base plate mounting, M4 thread holes, maximum penetration 3.0 mm (0.12 inch) from outside face of chassis, 10 kgf.cm (8.8 inch.lbs)Max torque refer to fig 1.
2. Side mounting, M4 thread holes, maximum penetration 4.0 mm (0.16 inch) from outside face of chassis, 10kgf.cm (8.8 inch.lbs) Max torque refer to fig 2.
3. J1 is AC input terminal block and with M4 screw in three positions, wire gauge is 10~18 AWG, 10 kgf.cm (8.8 inch.lbs) Max torque.
4. J2 is DC output terminal block and with M4 screw in two positions, wire gauge is 6-18 AWG. 10kgf.cm(8.8inch.lbs) Max torque.
5. J3/J4 is control or signal connection.
6. VR: clockwise is to increase the output voltage, anti-clockwise is to reduce the output voltage.

Phone: (973) 594-1800
Salesteam@BluTekPower.com