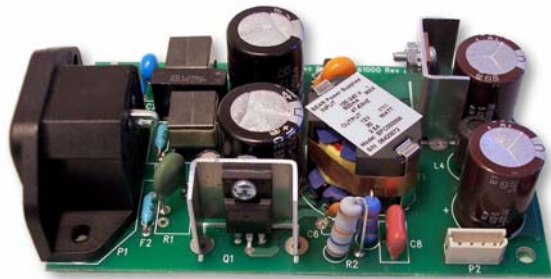
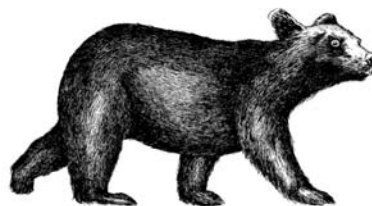


Commercial, Industrial & Medical Power Supplies



■ standard products ■ custom designs ■ 2008



BEAR
POWER SUPPLIES

1-800-551-BEAR ■ www.bearpwr.com

Rugged, Reliable Power - only from BEAR

Power supplies built for performance and reliability
in the most demanding commercial, industrial & medical applications

How long do you want your power supply to last?

When you need reliable, long lasting power... count on BEAR. We specialize in rugged, compact power supplies with long life, over wide operating temperature ranges, in harsh environments.

Quality and innovation

Quality and innovation are the keys to long life. We start with high-quality components. Then we use innovative design techniques to achieve compact form factors while minimizing stress on the components. Finally, our production team adheres to rigorous manufacturing standards including IPC 610.

This combination of:

- quality components
- innovative design techniques and
- world-class manufacturing

yields power supplies that you can count on for years of reliable, trouble-free operation.

BEAR power supplies are used in:

- Medical
- Telecom
- Transportation
- Avionics
- Communications
- Outdoor lighting & security
- Industrial automation

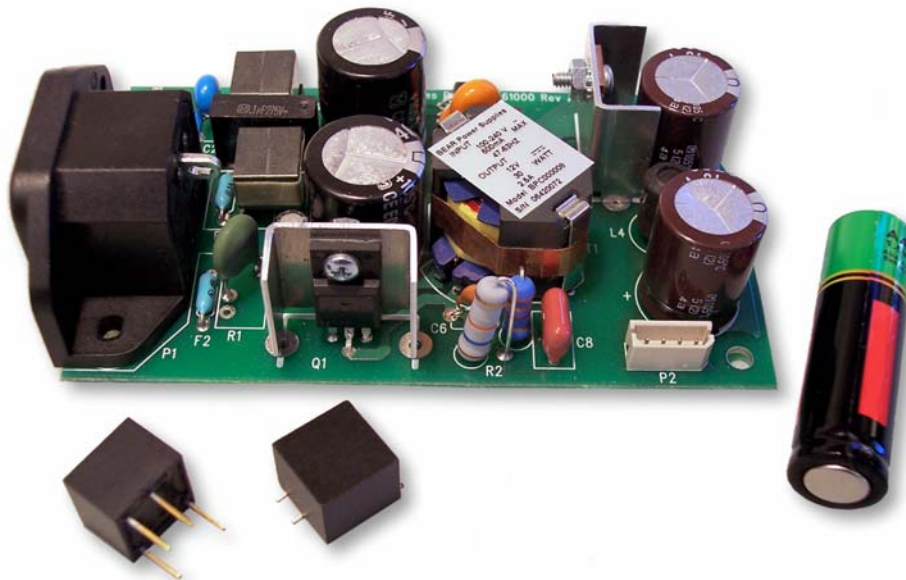
...and many other commercial, industrial and medical applications

Experience you can rely on

We are power supply experts, with background experience in commercial, industrial and medical system design. Our engineering team, located in the USA, is ready to work with you on your toughest power supply challenges. Call us today!

1 (800) 551-BEAR





Lead free and certified

All standard BEAR power supplies are RoHS compliant and safe for use in lead-free wave solder lines. Our custom supplies are lead-free unless you specify a leaded process.

Most standard models are TÜV certified and CE marked, meeting safety and performance specifications from UL, EN, IEC and CAN/CSA.

Designed and manufactured in the USA

BEAR power supplies are designed and manufactured in our modern 32,000 square foot facility in western New York. With design engineering, manufacturing, purchasing, sales and support all under one roof, we offer you:

- Higher quality
- Shorter, more predictable lead times
- Expert custom design services
- Closed-loop DFM processes
- Prototype and production for nearly any volume
- Real-time technical support and rapid response to your requests

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Standard AC/DC Power Supplies

Rugged, encapsulated modules
built for performance, reliability and long life



Innovation & convenience for demanding applications

BEAR's innovation in power means convenience and reliability for you.

PCB mountable models with our **mini IEC input connector** eliminate exposed high voltage traces from your printed circuit board. This patented module makes your system easier to design, test and certify.

Our **remote enable function** allows you to activate the supply remotely, adding convenience and safety. For example, you may mount the power supply at the rear of your chassis, near the line input, and use a front panel switch to turn the supply on and off — without routing primary AC power to the panel. Connect the Enable pin to the negative terminal to turn the supply OFF; leave the Enable pin open to turn it ON.

Our standard, compact modules incorporate **active inrush current limiting, fused input** and **Class B EMI filtering** to save you time and board space.

With this kind of innovation, BEAR helps you get smaller, high-reliability products to market faster.

- 5 to 30 Watt models
- Universal AC input
- Single output 3.3 to 48 V
- TÜV certified and CE marked
- Lead free and RoHS compliant
- Wide operating temperature -40 to +70°C
- Low inrush current
- Long life in harsh environments (MTBF 250,000 hours)

Operating specifications for standard AC/DC power supplies

	Condition	Min	Typ	Max
Input				
Input frequency (Hz)		47		63
Input current (A)				
5W output	110/220 VAC		0.1 / 0.06	
10W output	110/220 VAC		0.2 / 0.11	
15W output	110/220 VAC		0.28 / 0.19	
30W output	110/220 VAC		0.55 / 0.37	
Inrush current (A peak)	264 VAC			8
Leakage current (µA)				500
Input voltage (VAC)		90		264
Output				
Hold-up time (ms)	115 VAC full load		10	
Output voltage			See product charts	
Output current			See product charts	
Output voltage accuracy (%)				+/- 3
Line regulation (%)				+/- 0.5
Noise & ripple (% pk-pk)			0.7	1
Temperature coefficient (%)			+/- 0.1	+/- 0.3
Over-voltage protection (%)*		105	115	130 *
Overload protection (%)			130	
Load regulation (%)	90-264 VAC			+/- 0.5
General				
EMI				FCC Class B
Efficiency (%)			75	
Isolation voltage (VAC)		3000		
Switching frequency (kHz)				
5W and 10W output			100	
15W and 30W output			60	
Environmental				
Humidity (%)		0		95
Operating temp range (°C)	Full load	- 40		+ 60
	Half load	- 40		+ 70
Storage temp range (°C)		- 40		+ 85
Cooling			convection	

* at 3.3 V, max over-voltage protection is 140%

PCB mountable

We offer an “industry standard” five-pin package, along with our patented mini IEC input modules for improved safety and convenience.

For operating specifications see page 3.

For mechanical drawings call us or visit www.bearpwr.com.

PCB mountable models

Part Number	Power	V/i	Dimensions (inches)
BP1 Series			
<i>+Vin, -Vin, +Vout, -Vout, GND pins on package bottom (no Enable)</i>			
BP11005xxx	5 W	see chart	1.75 x 2.25 x 0.75
BP11010xxx	10 W	see chart	1.75 x 2.50 x 0.75
BP11015xxx	15 W	see chart	1.89 x 2.75 x 0.92
BP11030xxx	30 W	see chart	2.50 x 3.50 x 0.92
BP2 Series			
<i>Universal AC input (2-pin IEC connector)</i>			
<i>+Vout, -Vout and Enable* pins on package bottom</i>			
BP21005xxx	5 W	see chart	1.75 x 2.89 x 0.75
BP21010xxx	10 W	see chart	1.75 x 3.14 x 0.75
BP21015xxx	15 W	see chart	1.89 x 3.39 x 0.92
BP21030xxx	30 W	see chart	2.50 x 4.14 x 0.92
190203380	2-pin line cord, 18 AWG		6' long
BP3 Series			
<i>Universal AC input (3-pin IEC connector)</i>			
<i>+Vout, -Vout and Enable* pins on package bottom</i>			
BP31005xxx	5 W	see chart	1.75 x 2.64 x 0.75
BP31010xxx	10 W	see chart	1.75 x 2.89 x 0.75
BP31015xxx	15 W	see chart	1.89 x 3.14 x 0.92
BP31030xxx	30 W	see chart	2.50 x 3.89 x 0.92
190203390	3-pin line cord, 18 AWG		6' long

*See page 3 for use of the Enable pin

Voltage and current

Part Number Suffix (xxx)	033	050	120	150	240	480
Voltage (V) →	3.3	5	12	15	24	48
Current (A) ↓						
5 W	1.52	1.00	0.42	0.33	0.21	n/a
10 W	3.03	2.00	0.83	0.67	0.42	n/a
15 W	4.55	3.00	1.25	1.00	0.63	n/a
30 W	9.09	6.00	2.50	2.00	1.25	0.625

AC/DC power supply certifications

Certifications for safety and performance, including use in medical instruments, include UL2601-1, UL60950-1, CAN/CSA-C22.2 (No.601.1-M90), CAN/CSA-C22.2 (No.60950-1-03), EN 61000-3, EN 61000-4, EN 60601-1-2, IEC 601-A/A2, and EN 55011.

BP1 Series

The five-pin BP1 is pin- and footprint-compatible with a number of industry-standard commercial power supplies. It incorporates functions such as EMI filtering, inrush current limiting and double-fused input – to give you more features and convenience in the same space as competing supplies.



BP2 and BP3 Series

These patented modules feature a mini IEC input connector and detachable line cord. This unique feature allows you to eliminate exposed high voltage traces from your circuit board.

Remote Enable and Vout pins on the package bottom are lead-free and withstand wave solder without contaminating lead-free processes.



Line cords for the BP2 and BP3 are sold separately. Standard 6-foot domestic cords are available from stock. International cords are available on request.

Chassis & DIN rail mountable

Chassis mountable encapsulated power supplies are available with mini IEC or terminal block input. All have terminal block connections for +Vout, -Vout and Enable.

All BEAR standard AC/DC converters incorporate functions such as EMI filtering, inrush current limiting and double-fused input in compact encapsulated packages.

BP4 Series

Chassis mountable package with terminal block connections.



BP5 and BP6 Series

Chassis mountable package with mini IEC input connector for safe, convenient universal AC line input. Terminal block for output and Enable connections.



BP7 Series

DIN rail mountable supply with terminal block connections.



AC/DC power supply certifications

Certifications include UL2601-1, UL60950-1, CAN/CSA-C22.2 (No.601.1-M90), CAN/CSA-C22.2 (No.60950-1-03), EN 61000-3, EN 61000-4, EN 60601-1-2, IEC 601-A/A2, and EN 55011.

- 5 to 30 Watt models
- Universal AC input
- Single output 3.3 to 48 V
- TÜV certified and CE marked
- Lead free and RoHS compliant
- Wide operating temperature -40 to + 70°C
- Low inrush current
- Long life in harsh environments (MTBF 250,000 hours)

For operating specifications see page 3.
For mechanical drawings call us or visit our website.

Chassis and DIN rail models

Part Number	Power	V/i	Dimensions (inches)
-------------	-------	-----	---------------------

BP4 Series

Chassis mount package with terminal block connections for AC line, AC GND, AC neutral, +Vout, -Vout, Enable*

BP41005xxx	5 W	see chart	1.75 x 3.15 x 0.82
BP41010xxx	10 W	see chart	1.75 x 3.41 x 0.82
BP41015xxx	15 W	see chart	1.89 x 3.66 x 0.99
BP41030xxx	30 W	see chart	2.50 x 4.15 x 0.99

BP5 Series

Universal AC input (2-pin IEC connector) terminal block connections for +Vout, -Vout, Enable*

BP51005xxx	5 W	see chart	1.75 x 3.19 x 0.82
BP51010xxx	10 W	see chart	1.75 x 3.44 x 0.82
BP51015xxx	15 W	see chart	1.89 x 3.69 x 0.99
BP51030xxx	30 W	see below	2.50 x 4.49 x 0.99
190203380	2-pin line cord, 18 AWG		6' long

BP6 Series

Universal AC input (3-pin IEC connector) terminal block connections for +Vout, -Vout, Enable*

BP61005xxx	5 W	see chart	1.75 x 2.94 x 0.82
BP61010xxx	10 W	see chart	1.75 x 3.19 x 0.82
BP61015xxx	15 W	see chart	1.89 x 3.44 x 0.99
BP61030xxx	30 W	see chart	2.50 x 4.24 x 0.99
190203390	3-pin line cord, 18 AWG		6' long

BP7 Series

DIN rail mount package with terminal block connections for AC line, AC GND, AC neutral, +Vout, -Vout, Enable*

BP71005xxx	5 W	see chart	1.75 x 3.15 x 0.84**
BP71010xxx	10 W	see chart	1.75 x 3.40 x 0.84**
BP71015xxx	15 W	see chart	1.89 x 3.65 x 1.01**
BP71030xxx	30 W	see chart	2.50 x 4.15 x 1.01**

*See page 3 for use of the Enable pin
**BP7 height measured from base

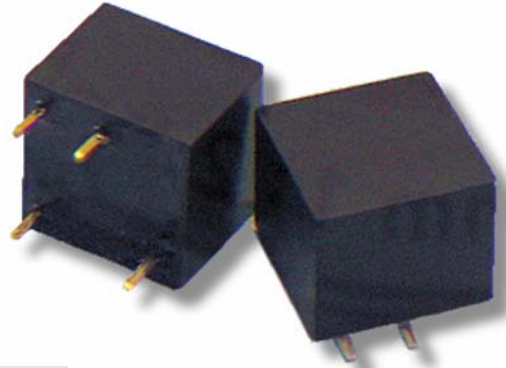
Voltage and current

Part Number Suffix (xxx)	033	050	120	150	240	480
Voltage (V) →	3.3	5	12	15	24	48
Current (A) ↓						
5 W	1.52	1.00	0.42	0.33	0.21	n/a
10 W	3.03	2.00	0.83	0.67	0.42	n/a
15 W	4.55	3.00	1.25	1.00	0.63	n/a
30 W	9.09	6.00	2.50	2.00	1.25	0.625

Standard DC/DC Power Supplies

High-voltage isolated 1.5 W converters have high efficiency for powering PIN diodes, APDs, piezoelectric devices and more

- Ultra-miniature size
- 90% efficiency
- Superior load regulation
- Wide operating temperature -55°C to +85°C
- No heat sink or electrical derating required
- 1.5W output @ 85°C ambient
- Excellent input-output isolation



Typical characteristics for standard DC/DC converters

at 25°C ambient and input voltage at nominal value unless noted

BPS Series	
Models	BPS0xyyy – SMT package BPS1xyyy – thru-hole package (xx=input voltage, yyy=output voltage)
Input voltage (VDC)	3 to 15 VDC (Single input, factory configurable)
Output voltage (VDC)	50 to 300 VDC (Single output, factory configurable)
Line regulation	Unregulated / output directly proportional to input
Load regulation	3% Δ from no load to full load
Efficiency	90% typical
Input voltage range	± 10% of configured input voltage
Output voltage tolerance at full load (nominal)	Input ± 3% (<i>tighter tolerance available, please call</i>)
Input-output isolation	100 MΩ minimum at 1000 VDC
Output temperature coefficient	0.02% per °C
Operating temperature	-55 to +85°C ambient (<i>no heat sink required</i>)
Storage temperature	-55 to +125°C
Dimensions	0.5 x 0.5 x 0.4 inches (12.7 x 12.7 x 10.2 mm)

High reliability and efficiency in a low-profile package

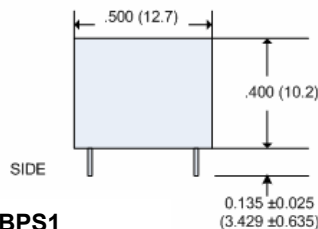
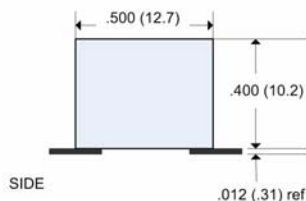
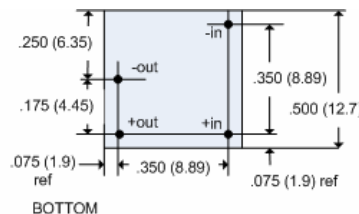
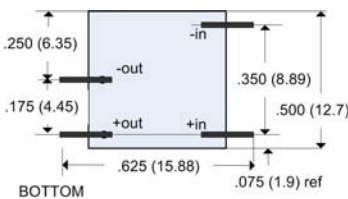
BPS Series high-voltage DC-DC converters feature up to five times better efficiency and ten times better load regulation than similar products on the market.

These high-reliability isolated converters operate from -55°C to +85°C with no heat sink or electrical derating required.

Use these miniature, low-profile converters in RF transceivers, programmable filters and industrial or scientific instruments.

The ultra-miniature encapsulated package is only 0.4" (10.2 mm) tall, with a total 0.1 cubic inches and weight of just 4 grams. It is available in both thru-hole and SMT versions.

BPS Series converters have a single input voltage (configurable from 3 VDC to 15 VDC) and a single output voltage (configurable from 50 VDC to 300 VDC). They are unregulated; output voltage is directly proportional to input voltage.



BPS0

BPS1

Custom Power Supplies

Rugged, reliable power – built to suit your needs

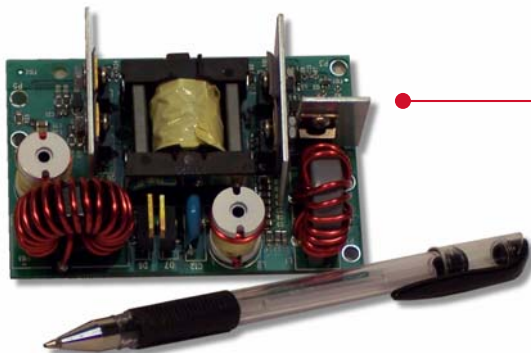
BEAR excels at custom power supply design and manufacturing. Our custom power converters are compact and rugged. Like all BEAR products, they are designed and built for long life and reliable operation over a wide operating temperature range.

BEAR custom power supplies are used in a wide range of industrial, commercial and medical applications - from military and telecom to LED lighting and portable systems. **We specialize in meeting unusual requirements.**

Have a look at some of our recent projects on these pages... and then give us a call to find out what we can do for you.

- Power range from mW to KW
- AC/DC
- DC/DC
- DC/AC
- Encapsulated and open frame
- Single and multi output
- High power density
- Wide operating temperature
- Experienced, responsive design team
- Rapid turn-around
- Reasonable NRE

BEAR custom power supplies - examples



180 W DC/DC converter

Industry	ground transportation
Unique features	4000 VAC input / output isolation very long life low input and output noise

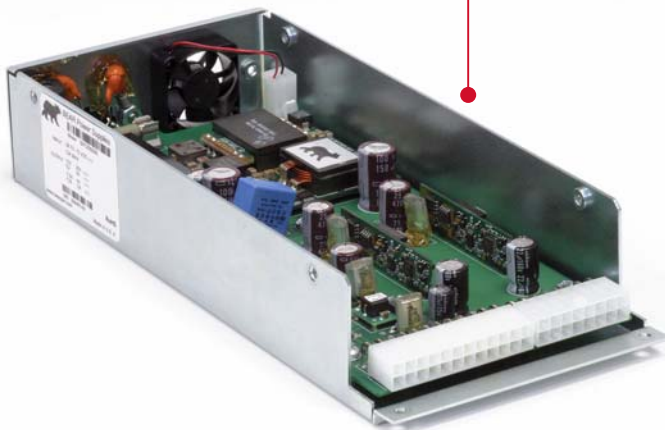
Designed to meet the customer's requirement for extremely high input/output isolation, this DC/DC converter also allowed the customer to reduce the size and cost of their existing system.

300 W DC/DC converter

Industry	commercial telecom
Unique features	4 outputs -48 VDC input high efficiency

High efficiency allows this unit to be cooled with a single fan. It replaced an off-shore manufacturer's power supply that is less efficient and required two large cooling fans.

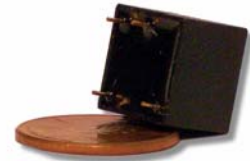
BEAR's design recommendations also allowed our customer to remove other hardware costs from their system, which has been NEBS 3 certified.



BEAR custom power supplies - examples

1.5 W mini DC/DC converter

Industry	military (portable communications)
Unique features	high efficiency over wide load 100 VDC output wide operating temp. range superior input/output isolation



30 W AC/DC converter

Industry	medical
Unique features	high efficiency over very wide input and load range mechanically rugged entire heat load contained in a sealed unit sealed input connector for system wash-down and disinfecting

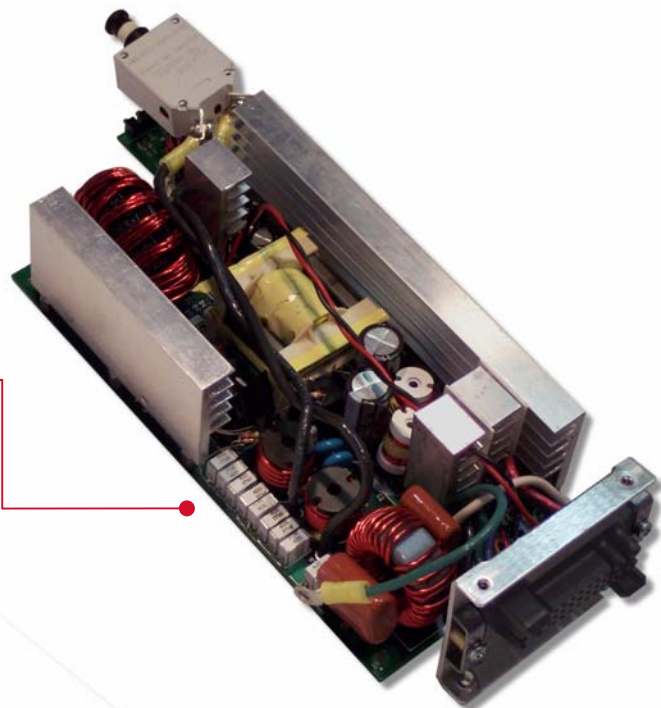


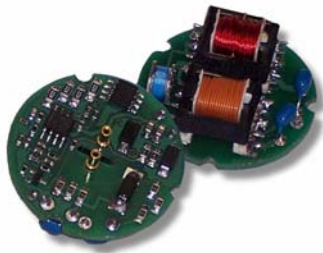
Designed for a portable medical system, this module meets very specific mechanical constraints. BEAR also met the challenge of achieving high efficiency over a wide range of input and load conditions.

850 W DC/DC converter

Industry	communications
Unique features	3 isolated outputs hot-swappable with load sharing

Specific mechanical constraints guided this rugged design, destined for a rack-mounted system in a mobile communications unit.



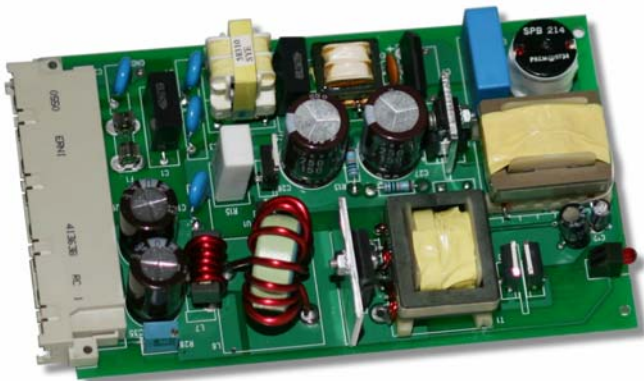


BEAR custom power supplies – examples

10 W constant power DC/DC converter

Industry	portable lighting
Unique features	high efficiency <i>20% greater than customer's previous solution</i> higher power density constant output power as input battery voltage changes

Innovative design allows our customer to use one standard power supply unit across their entire product line, replacing four different power supplies and extending the input voltage range at the same time.



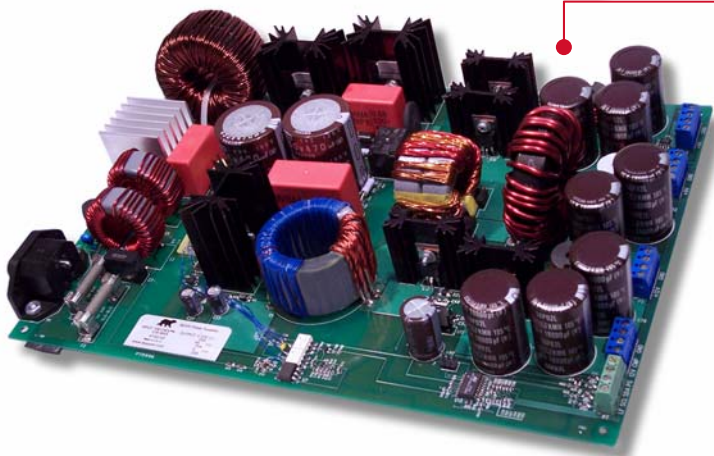
60 W AC/DC converter with PFC input

Industry	industrial monitoring
Unique features	minimum 10-year life 24/7 operation in fanless system specific mechanical configuration and input connector requirements

660 W AC/DC power supply with PFC

Industry	medical
Unique features	very low leakage current (5 μ A) exceeds standards for Type CF medical equipment 3 isolated outputs Universal input with PFC front end

This power supply includes a unique “self-monitoring” feature with built-in digital reporting of output voltages, current and operating temperatures.



The custom advantage

A custom design may not be the low-cost option. Done right, however, it can be highly cost-effective. With a custom design:

- You can have exactly what you need – less wasted time and fewer compromises than working around the limits of off-the-shelf supplies.
- You may potentially eliminate other components (e.g. fans) and their associated costs.
- You have greater flexibility to optimize your electrical and mechanical design.

The BEAR advantage

Our experienced US-based engineering team will take the time to understand your system goals and requirements. Then we will work with you to create the “perfect” power supply.

With our design and manufacturing center under the same roof, we offer quick prototypes and easy transition from design to pilot to full production.

We offer long-term support for our products. In fact, we are currently building and supporting products that we designed nearly 20 years ago.

BEAR custom power supplies - example

620 W AC/DC supply with PFC (prototype)

Industry	telecom
Unique features	Designed for long life in a fanless system
	very low input noise
	3 outputs
	hot-swappable with load sharing on each output

Photo shows working prototype

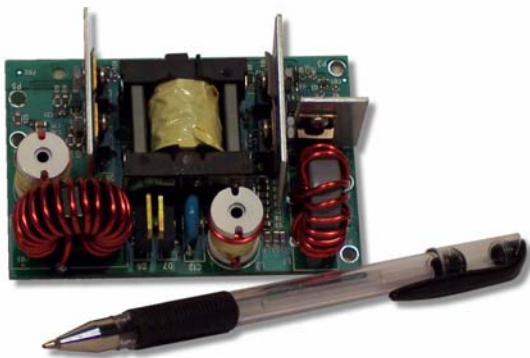
Ensure a successful custom project

Over years of designing custom power supplies, we’ve learned that good communication is the single biggest key to success. The more we know about your needs – the better we can meet them. For example:

- ❑ **What is your actual operating temperature?** If the power supply will be in an enclosed box, this is higher than the system ambient.
- ❑ **What is your load?** Watch out for motors (inductive sine waves), poorly-filtered digital logic, and DC/DC converters that pull large current pulses. High-reactive loads may require special design techniques for proper start-up, overshoot and stability.
- ❑ **What lifetime do you expect?** This will guide cost vs. quality tradeoffs in component selection.
- ❑ **What is your line quality?** Will there be high-voltage transients, such as from lightning? Will there be power dips, such as from large machinery on the same phase as your system?
- ❑ **What environmental factors should we consider?** Let us know where your system is going, and we can design with that in mind. For example, for portable systems we can choose low-profile components and consider potting or conformal coating for stability.

To learn more, download the article “How to spec a reliable custom power supply: 5 essential tips” at www.bearpwr.com or call **1 (800) 551-BEAR** for your free copy by email.





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