

# POWervamp

ADVANCED POWER SOLUTIONS



HAND-PORTABLE GPUs

LIGHTWEIGHT DC POWER SUPPLIES

GPU BATTERY CARTS AND TRUs

PORTABLE FUELLING/DE-FUELLING

PORTABLE HEATING



“Recognised worldwide for quality and the reliability of its aviation products, Powervamp has always responded to the changing needs of the aviation industry with new designs and innovative solutions in ground power and GSE accessories.

Helped by a worldwide distributor network, aircraft operators in more than 60 countries now rely on Powervamp products. Powervamp is unique as a specialist manufacturer, designing and producing a range of AC and DC ground power units from small DC portable battery packs to 90 kVA solid-state frequency converters for FEGP installations at airports. AC frequency converters from 20–90 kVA are produced at the company's Luton factory with DC products assembled at Weston-super-Mare.

This brochure shows a selection of the products and services we offer to all sectors of the aviation industry – from airframe manufacturers, scheduled airlines and airport operators to governments, military forces, EMS operators, airborne law enforcement agencies and civil operators.

Starting the business in 1993, my emphasis then was on product quality and supporting our customers – that company philosophy has not changed.

The Powervamp team is proud of its pioneering work in the development and manufacture of eco-friendly ground power systems. It is committed to producing high-efficiency ground power products for the aviation market that minimise carbon emissions and reduce operating costs.”

**Richard Roller**  
Company founder



Richard Roller

## DC HAND-PORTABLE GPUs

### 12v GA PACK



**Typical power plant:\* All aviation piston engines. All petrol up to 7.0 litres+. Diesel 1.8–3.5 litres depending on vehicle type**

**12v GA PACK** High-powered 12v starter pack for frequent, everyday professional use. Suitable for starting all 12v aircraft and petrol engines including 4 x 4. Also starts 12v diesel engines up to 3.5 litres, depending on vehicle type.

**12/24 GA PACK** A very tough high-powered 24 volt portable battery pack with 12 volts output for light vehicles. Designed to start all heavy 24 volt plant, from the largest aircraft tug or crash tender to small ramp vehicles. The pack uses ultra high discharge maintenance-free sealed lead acid batteries. It is supplied with charger and two sets of detachable colour-coded 2-metre leads in low temperature flexible 50mm sq cable. One lead set has special wide jaw 1000 amp cast brass, braided and insulated alligator clips to allow easy battery terminal connection. The second set is fitted with a heavy duty rubber aircraft nato plug, to allow starting of plant and light jets fitted with the standard Nato connector.

Able to start up to 30 heavy diesels on a single charge, the pack can deliver in excess of 18,000 watts of instant power. It is fitted with anti-surge protection to prevent damage to engine management systems, and is housed in an impact resistant polyethylene all-weather case.

### 12/24 GA PACK



**Typical power plant:\* Arrius, Rolls-Royce 250, PT6A-27. Continental and Lycoming piston. 24V diesel to ten litres (600 cu in), 12V diesel to 3 litres (180 cu in)**

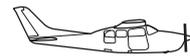
#### 12/24 GA PACK



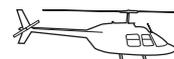
Small fixed wing GA piston aircraft



Small turbine and piston helicopters



Small turboprop and all piston aircraft



Free turbine helicopters: police, SAR, Hems, Executive

## SPECIFICATIONS

	12vGA	12/24 GA
Peak amps (max short circuit current)	1200	1800
Cell capacity 12 volt	29 amp/hrs	29 amp/hrs
Cell capacity 24 volt	–	29 amp/hrs
Recharge time from 50%	5 hours	5 hours
Case	Polyethylene impact-resistant moulded case	
	Height	Width
<b>12/24 GA</b>	570mm (22in)	180mm (7in)
<b>12v GA</b>	350mm (14in)	210mm (8in)
	Depth	Weight (without trolley)
<b>12/24 GA</b>	158mm (6in)	21kg (46lbs)
<b>12v GA</b>	160mm (6in)	13.8kg (30lbs)

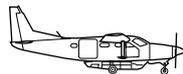
# GPU 1500S



**Typical power plant:\* PT6A-27, TFE 331, Arriel, Williams FJ33, GE H80**

**GPU 1500S** In military use worldwide, this latest version of the 1500 GPU uses a tough, corrosion resistant, all stainless steel case with flush sides and full-length handle to prevent snagging in confined spaces. A heavy-duty pull-on/push-off isolator/emergency 'power kill' knob with 'on condition' replaceable silver-plated copper contacts ensures maximum power transfer with minimum voltage drop.

The GPU is ideal for carrying on board and for emergency power and turbine starting. Fitted with auto-selecting integral modular mini charging system for remote charging and maximum cell recharge. Suitable for starting all on-board APUs and medium size free turbines.



**Small turboprop (Cessna Caravan series, Pilatus PC-12, PC-7, PC-9, Socata TBM 850) and all piston aircraft**



**Free turbine helicopters: police, SAR, Hems, Executive (e.g. Agusta 109, Dauphin, A-star/Ecureil, BK117, S76, AS 350, EC 120B, EC 130B, EC 135, EC 145)**

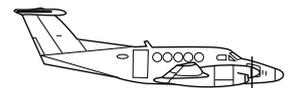
# GPU 2000S



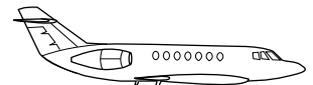
**Typical power plant:\* TPE 331, Arrius, ALF 502**

**GPU 2000S** Designed as a larger, more powerful pack than the GPU1500, where the starting of larger turbines with longer start cycles demands more amp/hr capacity, the GPU 2000 is a high performance pack designed for tough daily operations in harsh or remote environments.

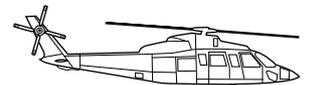
It can also be coupled in parallel to double its capacity. A simple parallel yoke will instantly connect two GPU 2000 units to become the GPU 4000T (twin). The GPU has the same heavy-duty pull on/push off isolator as the GPU1500, with replaceable 'on condition' silver-plated contacts for maximum power transfer.



**Corporate turbo prop**



**Corporate jets**



**10-16-seat helicopters with shaft turbines**

## SPECIFICATIONS

	GPU 1500S	GPU 2000S		
Peak amps:				
Nominal short circuit current	1500	2000		
Cell capacity	26 amp/hrs	38 amp/hr		
Cell configuration	series	series		
Standing volts (off charge)	25.6 volts nominal	25.6 volts		
Charging	internal 3 stage charger with LED display			
Ambient temperature range	-30°C to +40°C (-22°F to +104°F)	-40°C to +40°C (optional +50°C) (-40°F to +104°F (optional +122°F))		
Case	All-welded antimagnetic stainless steel case with screw-retained rear cover. Pack sits on 2 x transverse welded 'u' section feet with cut-outs to suit optional lightweight trolley	Non-magnetic stainless steel with M3 screw-retained rear panel for easy service		
Accessory socket	Top-mounted ABS 4-pin plug with screw cap – fuse protected			
Isolator	Push/pull contactor with security 'R' clip and replaceable contacts			
Output socket	Flush mounted polarised plug	Flush mounted polarised plug Auxiliary end-mounted power port designed to accept optional 28V DC continuous power supply or optional fast charger		
Nato stock number	NCAGE: KD628 NSN: 2990-99-930-3147	NCAGE: KD628 NSN: 2995-99-230-9194		
	Height	Length	Width	Weight
<b>GPU 1500S</b>	450mm (18in)	340mm (13in)	110mm (4in)	23.5kg (52lbs)
<b>GPU 2000S</b>	450mm (18in)	440mm (17in)	110mm (4in)	32kg (70lbs)

# DC HAND-PORTABLE GPUs

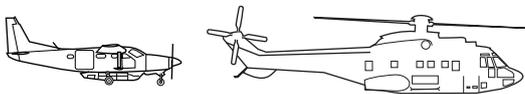
## GPU 1500/40



**Typical power plant:\*** TFE 331, PT6-27, Arriel

**GPU 1500/40** Incorporates an internal 40 amp continuous 28 volt DC output using split 20 amp power supplies for redundancy.

The modular design allows easy swap out and field servicing. Input voltage is selectable 110/230 volts 50/60Hz. Packs can be paralleled to double continuous output and amp/hr capacity (model 3000/80).



**Small turboprop, free turbine engines**

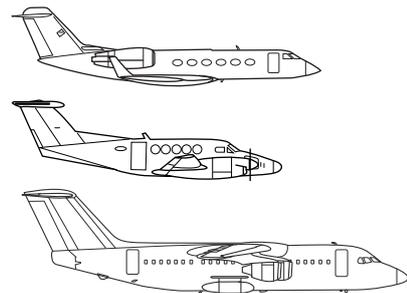
## GPU 3000/80



**Typical power plant:\*** TPE 331, PT6-67, Makila, TFE 731, LF 507, CF 34, PW 120, PW 308

**GPU 3000/80** Comprises 2 x 1500/40 GPUs connected in parallel. This twin pack is for starting larger helicopters and business jets where larger turbines or turboprop aircraft require higher instant amperage and longer start cycles.

The 3000/80 delivers more performance while still enabling the operator to handle and stow the units due to the lower individual pack weight. The integral power supplies make the units ideal for maintenance and lengthy pre-flight checks. Larger DC business jets and helicopters generally have higher continuous power requirements during ground ops. The 3000/80 will deliver 80 amps continuous power when connected to mains power.



**Shaft turbines, medium turboprop, executive jets**

## SPECIFICATIONS

	GPU 1500/40	GPU 3000/80		
Nominal voltage	25.4V	25.4V		
Output voltage	25.4V (28V when mains input connected)	25.4V (28V when mains input connected)		
Cell capacity	29 amp/hrs	58 amp/hr		
Peak amps (max short circuit current)	1500 amps	3000 amps		
Output amps (max)	40 amps	80 amps		
Re-charge time (40 amp internal power supply) from 50% discharge	20 minutes			
On-board charger	2 x 20A internal power supplies	4 x 20A internal power supplies		
AC input requirements	100-132V or 200-264V 45-400Hz (selectable input voltage)			
Efficiency	82%			
Operating temperature range	-25°C to +40°C (-40°F to +104°F (optional +122°F))			
Cooling	Fan assisted			
Displays	Digital voltmeter; Power supply output status LEDs			
Accessory socket	Top-mounted ABS 4-pin plug with screw cap – fuse protected			
Output socket	Flush polarised plug. Auxiliary end-mounted power port designed to accept optional 28V DC continuous power supply or optional fast charger			
Case	Non-magnetic stainless steel			
	Height	Length	Width	Weight
<b>GPU1500/40</b>	300mm (12in)	400mm (16in)	135mm (5in)	26kg (57lbs)
<b>GPU3000/80</b>	450mm (18in)	440mm (17in)	110mm (4in)	52kg (114lbs)
NATO stock number	2990-99-6117404		NCAGE: KD628; NSN: 2995-99-230-9194	

\*This information is given in good faith

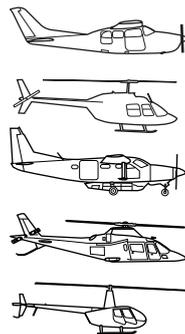
# Coolspool 17



**Typical power plant:\* Arrius 2F, Rolls-Royce 250**

**Coolspool 17** Advanced portable mini GPU designed as a lightweight emergency starting GPU for piston aircraft and light/medium turbine helicopters. The Coolspool 17 has power, performance and features that far exceed any other comparable mini GPU.

With a nominal voltage of 26–28 volts (for Eclipse-type aircraft) or 28–30 volts DC (for aircraft with a higher upper voltage limit – typically for single turbine helicopters), spool-up performance of this 17 amp/hr pack is more than 12% faster than a similar capacity 24V unit, with minimum weight penalty. Faster spool-ups mean cooler starts, aiding engine life. The Coolspool 17 has its own built-in mini charger. Connecting a 110/220V power cord to the unit will automatically activate the integral 3-stage charger. A 3-colour LED indicates charging status and a solid state digital voltmeter, with push-to-view button and timed auto shutdown, accurately displays output voltage.



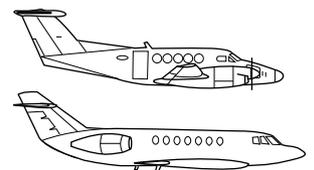
**Occasional use – single turbine civil helicopters, piston twins**

# Coolspool 29 and 58



**Typical power plant:\* TPE 331, PT6-67, Arrius**

**Coolspool 29 and 58** The 28 volt (nominal) 29 amp/hr Powervamp Coolspool 29 portable GPU was developed for larger turbine aircraft and helicopters where portability requirements limit weight and size, but the need to maintain voltage above minimum FADEC limits during the start cycle is critical. This requirement demands that the GPU voltage is at the top of the FADEC upper limit before starter engagement.



**Corporate jets**



**10-16-seat helicopters with shaft turbines**

## SPECIFICATIONS

	Coolspool 17	Coolspool 29	Coolspool 58	
Peak amps	900	1200	2400	
Capacity amp/hr	17	29	58	
Standing voltage (off charge)	28.5 volts	29 volts	29 volts	
Output voltage	29–30V DC; Optional lower voltage 26–28V	29V	29V	
Internal charger	Mini 3-stage fully-automatic dual 110/220V 50/60 Hz auto selecting capacity of 1.9 amps			
Case	All alloy welded with lie-flat handle	Light alloy with neoprene screw back and shock-absorbing feet		
Finish	Powder-coated yellow			
	Height	Length	Width	Weight
<b>Coolspool 17</b>	250mm (10in)	370mm (14in)	95mm (4in)	18kg (40lbs)
<b>Coolspool 29</b>	300mm (12in)	400mm (16in)	135mm (5in)	30kgs (66lbs)
<b>Coolspool 58</b>	300mm (12in)	400mm (16in)	270mm (11in)	60kg (132lbs)

# HEAVY DUTY DC BATTERY CARTS AND TRUs

## Coolspool 130



**Typical power plant:\* PT6A-27, Makila, TPE 731, GE T700, AE3007, CF34**

## Coolspool 260



**Typical power plant:\* PT6C-67, Makila, TPE 731, ALF 502, HTF7000, RR Tay**

### THE COOLSPool RANGE 130 TO 580 AMP/HOUR CAPACITY 26 AND 28 VOLT OPTIONS

### ULTRA HIGH DISCHARGE RAMP CARTS ENVIRONMENTALLY-FRIENDLY POWER

- NO NOISE
- NO POLLUTION
- NO MAINTENANCE

### MINIMUM OPERATING COST

### RAPID RETURN ON INVESTMENT

Powervamp's 28 volt **DC Coolspool ramp carts** are designed to replace diesel GPUs or fixed and semi-mobile transformer rectifier units (TRUs).

Where no mains power is present or noise curfews prohibit use of diesel GPUs, they are a highly efficient, low cost power source – operating at a fraction of the cost of a diesel GPU, yet able to deliver the same power and turbine starting output. These large, new generation, powerful, heavy-duty battery carts provide a combination of instant high amperage with pure DC wave form and full mobility, low initial investment and extremely low operating costs. Their zero noise and zero carbon footprint are the way forward for regional airlines.

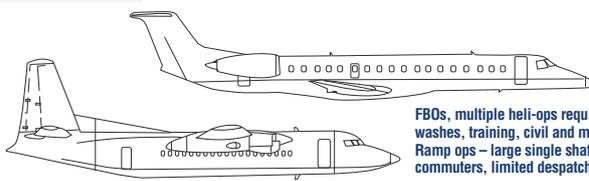
Direct cost comparisons between diesel and Coolspool show savings enabling some operators to amortise the Coolspool GPU in less than 6 months.

The Powervamp **TRU600/2000** is an advanced transformer rectifier unit delivering 28.5V at 600A continuous and 2000A peak for engine starting. Regulation is achieved using additional thyristor control BEFORE the transformer, to achieve a clean output with less ripple than traditional TRUs.

The TRU600/2000 is capable of worldwide operation as standard from the factory. It is supplied in the same compact frame as the DC power carts, making the unit highly manoeuvrable.



Drones, helicopters, turboprop twins, FBOs, medium ramp ops



FBOs, multiple heli-ops requiring heavy comp washes, training, civil and military. Ramp ops – large single shaft and 8-14 seat commuters, limited despatch or regional aircraft



## FEATURES (vary according to model)

### Simple controls

- Heavy-duty push/pull (emergency) isolator switch

### Full monitoring

- Digital voltmeter for GPU output voltage display
- Charge ammeter indicating charger output
- LED counter with start monitoring and interlock protection circuit (patent applied for) (410 only)

### All-weather operation

- Cold weather protection/anti-cold soak insulation

### Rough terrain chassis

- Elastomeric rear suspension
- Bolt-on replaceable front axle assembly
- Bolt-on side protection bars
- Bolt-on mudguards
- Removable rear control panel module

### General

- Paint finish – powder-coat yellow
- Replaceable alloy corrosion-proof panels
- Foot operated parking brake (410 only)
- Fire extinguisher (supplied only if shipped by road due to air transport regulations)
- 12 months warranty against faulty parts or labour (batteries are on a proportional warranty based on usage over time)

## SUPPLIED AS STANDARD WITH

- Spare wheel
- Foam fire extinguisher (road shipment only)
- 4-metre (13ft) double insulated DC output cable
- Nato plug
- Frame manufactured from steel hollow section, finished in powder-coat yellow, side panels all alloy replaceable

## OPTIONS

- 4-cable 70 mm (3in) section 4-metre (13ft) double-insulated output cable (for minimum voltage drop under very heavy load)

\*This information is given in good faith

# Coolspool 410



**Typical power plant:\*** PT6C-67, TPE 331-12, RR Dart 356, RR AE3007A, PW121, PW127, PW150A, ALF 502, CF34B, BR710

# TRU 600/2000



Coolspool 410: preflight and start



## SPECIFICATIONS

28V DC Battery Cart	CoolSpool 130	CoolSpool 260	Coolspool 410	TRU 600/2000
Peak amps (max starting current)	2000 amps	2500 amps	3500 amps	<b>INPUT:</b> Voltage 3-phase 200–480V
Amp hours	130 amp/hr	260 amp/hr	410 amp/hr	Frequency 50/60Hz
Max. power supply output	80	80	Separate charger	Rectification 6 pulse
Continuous rating (recommended)	60	60	n/a	Line current 30A @ 400V
AC input voltage @ 220V	16 amps	16 amps	DC input from separate charger. Options: 80 amps 1-phase; 240 amps 3-phase	Efficiency 90%
AC input voltage @ 110V	32 amps	32 amps		<b>OUTPUT:</b> Voltage 28.5V (adjustable)
Dimensions Length	1060mm (42in)	1060mm (42in)	1630mm (64in)	Current 600A (2000A peak)
Height	720mm (28½in)	720mm (28½in)	920mm (36in)	Output voltage 21–31V
Width	710mm (28in)	710mm (28in)	750mm (29½in)	Voltage regulation <0.5%
Weight	157kg (346lbs)	270kg (594lbs)	477kg (1,051lbs)	Voltage ripple <1%
Batteries – 28V	4 x 6V, 1 x 4V	8 x 6V, 2 x 4V	14 x 2V	Case Alloy panels, steel frame
26V	3 x 6V, 2 x 4V	6 x 6V, 4 x 4V	13 x 2V	Output cable 4-metre (13ft) double-insulated 70mm sq
Control panel:	Digital voltmeter, digital ammeter, On/Off power knob			Height 710mm (28in)
Charge input plug: CS130, CS260	Single phase 16 amps @240 volts mains input	Single phase 16 amps @240 volts mains input	S350 polarised DC accepts single- or 3-phase charger	Length 1060mm (42in)
ON/OFF emergency isolator:	Heavy-duty double pole push/pull switch with red mushroom knob			Width 720mm (28in)
Accessory socket:	28V DC accessory socket, fused @ 10 amps, suitable for worklight			Weight 220kg (485lbs)
Tyres:	4 x 260mm (10.5in) pneumatic		4 x 400mm (16in) pneumatic	
Charging	<b>Integral power supply.</b> 110/220V AC selectable single-phase switch mode powersupply/charger. Regulated to 31.2 volts DC. Units comprise 2 x 20 amp TEFC independent switch-mode modules paralleled for reliability. Short circuit protected, current overload protection		<b>External charger.</b> 110/220V AC selectable single-phase switch mode powersupply/charger. Regulated to 31.2 volts DC. Units comprise 2 x 20 amp TEFC independent switch-mode modules paralleled for reliability. Short circuit protected, current overload protection	
NCAGE:	KD628			

## THE POWERVAMP POWER SUPPLY RANGE

Electronic flight decks, once the sacred ground of the large corporate and wide body, are now common to every type and size of aircraft. Remaining ahead of the curve with the faster speeds of the VLJs requires private and corporate pilots to be proficient in the use of their EFIS. Practice and the need to update software are two reasons why all aircraft operators should own a reliable and compact power supply, able to be used for training, fault finding or software updates.

Powervamp's first 28 volt 40 amp power supply was produced in 1995 as a solution to the problem of training police observers on FLIR systems. Until then, training involved expensive helicopter flying hours or powering a FLIR system with battery GPUs with limited power duration.

Powervamp, with its range of power supplies from 30 to 600 amps, manufactures units for all types of aircraft from the Cessna 175 to the largest of DC aircraft such as the ATR, Embraer 145, Q400 and Saab 340.

Confirmation of Powervamp's quality and performance has been endorsed by some of the world's largest manufacturers of private, business and corporate jets who have selected Powervamp power supplies as their branded product supplied to customers for software updates and a source of DC power at remote locations. Other manufacturers too have selected Powervamp power supplies as the chosen unit for their service support teams. In every case, quality, reliability and product support are key.

## PS30C and PS50C



**Use: Designed for the smaller helicopter, VLJ or use with CoolSpool 17, 29, and 58 GPUs or as a DC power source**

Powervamp's **PS30C** and **PS50C** miniature power supplies are lightweight combination charger/power supplies able to deliver 30 or 50 amps depending on model, at a pre-set voltage between 28.4 and 31.5 volts (for 28 volt Coolspool charging) as selected by the operator. Power supplies can be connected directly to the aircraft's external ground power receptacle or to any of Powervamp's portable battery GPUs. They are designed for operators of smaller helicopters and VLJs needing to download data or programme avionics in any location where size and weight are important.

The automatic 120/240 volt 50/60Hz input allows international use. A solid state voltmeter displays the output voltage selected by the mode switch. Coloured LEDs confirm mode selection. A green and red LED indicates amperage below or above current limit protection.

Unique to the PS30C / PS50C are two pre-set voltages enabling the power supplies to charge both 24 and 28 volt portable GPUs or operate in parallel with them. Specification includes forced ventilated with thermal protection and current overload/short circuit and reverse polarity protection.

A single voltage unit (28.5V) is also available in this range (PS30/PS50).



## FEATURES

- Mains input voltage selector
- Digital voltmeter
- Mains on/off switch
- Current limit LED
- Power output status LED
- Padded protective jacket
- 2-metre (6ft) detachable output cable with fitted Lexan Nato plug

## POWER SUPPLIES AND COMBINED POWER SUPPLIES/CHARGERS IN THE POWERVAMP RANGE

Combined Power Supply/Charger	Dual Output Voltages (V)		Maximum current (A)	Suitable for charging	Input voltage required (V)
PS30C	28	31.5	30	24V/26V batteries	110/230 1-ph
PS50C	28	31.5	50	24V/26V batteries	110/230 1-ph
PS100C	28	31.5	100	24V/26V batteries	110/230 1-ph
PS300 (power supply only)	28	-	300	n/a	230/400 3-ph

# PS100C



**Designed to power large helicopters, full-size corporate jets and for ramp/hangar use, avionics shop and exhibition use**

Able to provide 100 amps of continuous power, Powervamp's PS100C is a 28V power supply designed to power flight decks of larger corporate/business aircraft using any AC single phase 110/230 volts 50/60 Hz input. It is supplied as the factory-approved product by one of the largest business aircraft manufacturers in the US.

The PS100C version has two pre-set voltages: 28.5V for lead acid battery charging and continuous avionics operation; and 31.5V for charging Coolspool GPU 17, 29, 58. Where only single-phase power is available it is also used to charge the larger Coolspool battery carts.

Delivering smooth, stabilised continuous DC power, the PS100 is compact and lightweight, allowing it to be stowed in any baggage hold.

Individual LEDs confirm DC output status and a digital ammeter and voltmeter accurately display output volts and amps so operators can monitor the current draw. An on-off C/B is used to switch power.

## FEATURES

- DC output voltage selector
- Digital voltmeter
- Digital ammeter
- Mains on/off circuit breaker
- 2 x paralleled 50 amp micro-power supply modules for redundancy
- 2 x PCB output status LEDs
- Fuse protected 28V accessory socket
- Padded protective jacket
- 2-metre (6ft) detachable heavy-duty output cable with heavy-duty rubber Nato plug

## OPTIONS

- Bandolier option. With the larger business aircraft flying internationally, Powervamp offers PS100 and PS100C users its unique optional 'Universal connector bandolier'. This selection of international plugs, neatly housed in a webbing bandolier, allows the user to instantly select and connect the correct input plug without the need to obtain and wire local plugs.



2 x PS100 in parallel delivering up to 200 amps

# PS300



**Ramp/hangar use, avionics shop and exhibition use**

The **PS300** power supply is a compact, high performance, 28 volt ramp or hangar unit, delivering 300 amps of continuous power for air conditioning, air show ground power or general maintenance.

Because each unit uses power supply modules connected in parallel, field servicing is simple. Modules can be rapidly removed and replaced and the failure of one module will have a minimum impact on output amps.

## SPECIFICATIONS

	PS30C	PS50C	PS100C	PS300
Max output	30 amps	50 amps	100 amps	300 amps
Output volts	28.5, 31.7 (selectable)		28.5, 31.7 (selectable)	28.5
Input volts	Auto. 120/240 single-ph. 50/60Hz		Auto. 120/240 single ph. 50/60 Hz	200-440 3-phase 32A 50/60 Hz
Max input current	120V 9 amps; 240V 4.4 amps		120V 36 amps; 240V 18 amps	200V 55 amps; 400V 26 amps
Input frequency range	45-400Hz		45-400Hz	
Efficiency	90%		90%	
Cooling	Single fan, forced air		triple fan, forced air	four fan, forced air
Case	powder-coated alloy with neoprene anti-slip feet			
	Height	Length	Width	Weight
PS30C	150mm (6in)	325mm (13in)	95mm (4in)	3kg (7lbs)
PS50C	155mm (6in)	350mm (14in)	140mm (5in)	6kg (13lbs)
PS100C	240mm (9.5in)	450mm (18in)	240mm (9.5in)	25kg (55lbs)
PS300	370mm (15in)	410mm (16in)	400mm (15in)	28kg (62lbs)

## Portapump



The Portapump unit is a rugged, all-weather fuel pump designed for the rapid fuelling or defuelling of all types of aircraft or vehicles using jet A1 or diesel with a flash point above 37°C. It is designed to be easily transported by aircraft, helicopter or vehicle.

Able to be carried by one man, it uses a powerful 24–28 volt DC motor direct coupled to a high-speed pump with phosphor bronze sliding vanes.

The power source can be any 24/28 volt supply such as a portable GPU, vehicle battery or aircraft DC bus. Alternatively a 110/220 volt domestic mains supply can be used with a DC voltage converter.

## SPECIFICATION

### 24/28 volt Portable Fuelling/De-fuelling Pump for aircraft and vehicles Suitable only for jet A1 and diesel

#### Aviation/military standard equipment

Case construction	All-welded stainless steel tubular open space frame		
Height	Width	Depth	Weight
490mm (19in)	360mm (14in)	330mm (13in)	27.5kg (61lbs) without hoses and power lead
Power requirement	24–28 volt DC, 14 amps peak. Power lead – 3 metres (10ft) of 4mm (0.16in) twin-core – connects to pump with polarized quick release plug		
Switching	On/Off switch, guarded by a 15A pop-out circuit breaker		
Filter warning	Indicated by three warning LEDs – Green, Yellow, Red		
Static bonding	1000 amp cast brass alligator clips with 5 metres stainless steel bonding wire. Clips to any part of the space frame		
Pump	Positive displacement sliding vane pump, giving 100 litres (26.4 gallons) per minute nominal at 1.5 metres (4.9ft) head approx		
Pump motor	24V DC – motor 340 watts		
Filter performance	Aviation fuel filter system gives clean, filtered fuel to 5 micron filtration with 98% efficiency and water separation to less than 2 parts per million		
Filter capacity	Holds 1.1 litres (2.3 pints) of water. Removes up to 0.64kg (1.4lbs) of impurities		
Hose (Suction side)	Supplied on suction side with 3 metres (10ft) of 1¼ inch hose, fitted to a 865mm (34in) 2-piece aluminium standpipe for use with standard 200 litre (45 gallon) drums		
Hose (Delivery side)	3 metres (10ft) of 1¼ inch pump to nozzle. Delivery nozzle full-flow type with pump automatic cut-off via back pressure operated switch		
Couplings	Quick-release 1¼ inch camlock type with protective blanking covers to prevent the ingress of contaminants or residual fuel spillage		
Protection	Padded protective transport jacket and hose stowage bag		
Nato stock number	NCAGE: KD628 NSN: 2910-99-297-691		

## FEATURES

- The pump and filter assembly is housed within a stainless steel tubular space frame. All pipework and fittings are alloy or stainless steel with 'Camloc' quick release fittings to give rapid connect/disconnect of inlet and outlet hoses
- The Portapump will filter contaminated fuel to 3 microns solids, and 2 parts per million water. Fuel drums or containers that would otherwise require a settling period after transport to allow fuel/water separation can be pumped immediately. Fuel drained from aircraft, vehicles or plant that would otherwise be discarded can safely be re-used once passed through the Portapump.
- Controls comprise three warning LEDs to alert the operator to the status of the system. When fuel flow is shut off at the nozzle by the operator, a 'back pressure' switch automatically switches off the pump, leaving the system in 'standby' mode, indicated by a red warning LED.
- Opening the fuel delivery nozzle causes pressure to drop and the pump to restart, confirmed by green LED. A warning amber LED indicates when the pump is receiving DC power, waiting for the nozzle to be opened to instantly continue fuel delivery. A resettable circuit breaker and internal thermistor protect the pump motor against overload and overheating.
- Pump rotation is protected by an audible alarm that sounds if the 28 volt DC input is connected incorrectly. An inlet non-return valve prevents drain-back (siphoning) and maintains the back pressure to allow activation of the pressure-operated switch that shuts off the pump motor.
- A non-return valve and coarse filter are mounted in a unique detachable cartridge which can be removed for inspection without tools.
- Filter status is indicated by the differential pressure gauge mounted on the stainless steel control panel. Normal pumping is indicated by a reading of approximately 5 PSI on the gauge. Progressive filter blocking is indicated by a gradual rise in differential pressure. At approximately 15 PSI the coalescer filter cartridge should be removed and replaced if necessary. A drain tap is fitted to allow any collected water to be removed daily.

## OPTIONAL EXTRAS

- Digital fuel flow meter on output line
- 110/220 volt 50/60Hz to 24–28 volt DC waterproof power converter
- 12 volt pump motor (factory fitted)
- 24 volt Powervamp Power Pack/portable GPU
- Trolley for ramp operations

## Portaheat



Engineered to operate in very cold or damp environments, Powervamp's Portaheat unique self-contained portable heating unit is designed to heat areas such as aircraft/helicopter flight decks, corporate aircraft cabins, portable accommodation or any internal or outside specific area.

A key feature is the unit's high temperature hot air output which unlike other heat sources can be precisely directed by 4 metre (13ft) temperature resistant flexible hose to a confined area for spot or general heating.

This versatile 5.5kW heater operates on fuels with a flash point above 37°C – typically Jet A1, AVTUR, kerosene or diesel – burning only 0.6 litres (0.15 US galls) per hour at maximum output. Designed as a compact self-contained module, it fits onto an optional lightweight collapsible trolley to allow easy movement between locations. The 5-litre (1.3 US galls) portable fuel container can be quickly removed and purged for air transportation.

Portaheat is the perfect solution for the rapid heating of localised areas, removing condensation, or the heating of areas that cannot be reached by a conventional heater. With its built-in rechargeable power supply and 110/230 volt 50/60 Hz input, the heater is fully independent. The flexible 100mm diameter hose allows the Portaheat to remain remotely sited while ensuring there are no odours, combustion gases or ignition source at the point of heat delivery.

In hostile environments, the Portaheat is perfect for spot heating during external maintenance operations, or for the thawing of fuel lines or assemblies and the warming of viscous fluids. Powervamp's Portaheat provides up to 5.5kW of thermostat-controlled heat. Its 100mm (4 in) outlet hose, to which an optional splitter can be fitted – can direct hot air to the flight deck and cabin of a medium sized biz-jet simultaneously. The double insulated optional hose extension minimises heat loss where longer hose runs are required.

The Powervamp Portaheat unit can be recharged from any 24 volt alternator output, 28 volt aircraft DC bus or any single phase mains supply, providing operational versatility at sites where mains power is not available. Portaheat is not certified for use in flight. Fuel tank should be emptied and purged before air transportation.

### SPECIFICATION

Maximum heating capacity	5.5Kw						
Charger input voltage	110/240V AC, 50/60Hz						
Operating voltage	11–14V DC						
Power source	12V integral battery						
Maximum fuse rating	10 amps						
Integral battery capacity	17 amp/hr						
Charging	Internal two-step 10 amp charger Recharge time from 80% discharge: 1.7 hours						
Protection	Low voltage shutdown (10.8 volts) and over temperature protection						
Construction	Powder coated pressed alloy with riv. nuts and stainless screws/rivets						
Finish	Powder-coated RAL 1028 (yellow)						
Fuels	Jet A1, AVTUR, kerosene, diesel						
Fuel tank capacity	5 litres, 1.32 US gallons						
Tank	Quick removable polyethylene tank						
Fuel tank run time	8 hours (battery pack amp/hr is limiting factor)						
Running time using integral batteries (fully charged)	approx. 4 hours						
Height	420mm	Width	400mm	Depth	300mm	Weight (exc. fuel)	30kg
	(16.5in)		(15.5in)		(12in)		(66 lbs)

### STANDARD EQUIPMENT

- 4 metres of 100mm diameter outlet hose
- 110/220V 24/28V DC 10 amp output all weather IP66
- Webbing hose bag

### OPTIONS

- Splitter plenum 100mm dia input to 2 x 75mm outputs
- 100 mm x 4m (4in x 13ft) hose extension
- Remote battery pack for extended run time



# STATIC FREQUENCY CONVERTERS

## PV90-3 and PV45 GPU



### PV90-3 GPU 90KVA 400Hz FIXED ELECTRICAL GPU

The latest generation aircraft such as the Boeing 787 with electric air-conditioning packs and electric start can demand 90 kW from a 90 kVA FEGP installation. The use of on-board air-con can require this for extended periods. As airports and operators seek to minimise costs and pollution, the demand for fixed electrical ground powering of aircraft systems can only increase. Powervamp's latest PV90 Mk3 Converter is designed to meet this demand by providing the ground power to run the electrical systems of the Boeing 787 and the next generation of aircraft.

Continuously delivering a genuine 90 kW (significantly more than the 90 kVA – 72 kW which is the generally quoted power) requires the generous sizing of electrical and electronic components and the ability to dissipate the heat generated at continuous full load.

### PV45 GPU 45KVA 400Hz MOBILE ELECTRICAL GPU

The PV45 GPU improves on the successful PV40 GPU with increased power output as well as many additional features. In particular the use of a 12-pulse rectifier provides improved input harmonics and power factor without compromising robustness and reliability.

Specifically designed for hanger use with optional plinth for fixed indoor or outdoor installation. With a power rating of 45kVA, the PV45 is targeted at the small to medium sized aircraft.

## SPECIFICATIONS

	PV90-3 GPU	PV45 GPU		
Output active power (kW)	90.0	36.0		
Apparent output power (kVA)	90.0	45.0		
<b>INPUT</b>				
Number of phases	3			
Nominal input voltage	400V 3 Wire + E (+ / - 10%)			
Nominal input frequency	50 / 60Hz (+ / - 10%)			
Rectification topology	12 Pulse			
Current distortion	< 8% @ 100% load	< 15% @ 100% load		
Power factor	> 0.97 @ 100% load			
Inrush current	N/A			
Maximum input circuit breaker	160A	63A		
<b>OUTPUT</b>				
Nominal output voltage	200 / 115V Three phase + N + E			
Static voltage regulation	< 1%			
Nominal output frequency	400Hz (+ / - 0.01%)			
Total harmonic distortion	< 3% (2% typical)			
Load power factor	0.7 lag – 0.9 lead			
Voltage modulation	< 1%			
Phase angle symmetry	120° (+ / - 1) for balanced load, 120° (+ / - 2%) 30% unbalanced load			
Dynamic response	MIL-STD-704			
<b>OVERLOAD</b>				
	90kVA @ PF1 Continuous 125% for 5 minutes, 200% for 5 seconds, 250% for 1 second, 1100A Peak Inrush	45kVA @ 0.8PF Continuous		
<b>EFFICIENCY</b>				
100% load	> 93%	> 91%		
50% load	> 90%	> 82%		
Standby losses	< 60W			
No load losses	< 2kW			
<b>GENERAL</b>				
Operating temperature	-40°C to +50°C			
Altitude	2000m before de-rating			
Protection level	IP55			
Colour	RAL 7035 (other colours available)			
Noise Level	< 65dBA @ 1m			
	Height	Width	Depth	Weight
<b>Standard PV90-3</b>	1450 (57in)	700mm (27.5in)	770mm (30in)	600kg (1323lbs)
<b>PV90-3 with 28VDC module (fitted underneath)</b>	1810mm (71in)	700mm (27.5in)	770mm (30in)	800kg (1764lbs)
<b>45kVA</b>	1063 (42in)	604mm (24in)	914mm (36in)	345kg (761lbs)
MTBF	100,000 hours			
MTTR	20 minutes		30 minutes	

# Powervamp

ADVANCED POWER SOLUTIONS

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