
Powervamp®
ADVANCED POWER SOLUTIONS
GREENER POWER
Aviation Ground Power
PRODUCTS AND SERVICES

Powervamp
ADVANCED POWER SOLUTIONS

World leaders in advanced power solutions

A LEADER IN DESIGN

The following pages display Powervamp's innovative product range. Many of our solutions are now standard throughout the ground power industry.

A LEADER IN EXPERIENCE

Seldom are manufacturers regular users of the products they produce. Powervamp is the exception. Our extensive "hands-on" air show experience gives us the technical edge in the market.

A LEADER IN CUSTOMER SUPPORT

Repeatedly, we outperform major corporations many times our size with our technical knowledge, our customer care and our rapid response capability.

"Since forming Powervamp almost 25 years ago, like anyone working in aviation for many years, I have witnessed massive changes in every area – from the weather and its effects on equipment design to the quality standard and high levels of power required to run today's AC and DC aircraft. The performance demands on equipment have never been higher, and with them come the need for outstanding product reliability and support.

No matter what size a manufacturing business is, it is the product quality, product performance and product support that create and build its reputation. As a business grows, it is essential that management invest in the direct and indirect overheads of the business if it is to maintain that reputation and competitive edge in the market.

Since the beginning, Powervamp product quality and customer support have been the key to our growth, with repeat business confirming the success of our strategy. Maintaining our reputation and developing new products have demanded continuous investment in every area – factory space, production staff, development engineers, expensive test equipment, a rapidly expanding installation and service team and a growing administration and management team to run the business.

Today, as a private company owned by its directors, Powervamp is not constrained by today's corporate reporting culture or driven by the need to maximise shareholder returns at the expense of product quality or service. For us, it is the customer who is always first. That is how it was when I started the business in 1993, that is exactly how it is today!

From headquarters near Bristol to the west of London and our R&D and manufacturing site of 20,000 sq ft near Luton, north of London, Powervamp now sells to more than 60 countries through its agents and distributor network, supplying the world's busiest airport and major airlines. With our highly skilled development team, we are proud to be the UK's sole designer and manufacturer of 400 Hz solid state frequency converters and specialised DC power carts – a position which ensures that we retain complete control over quality, spares and support.

In choosing Powervamp, I can guarantee that you will be entering into a long-term relationship with the company and its directors and staff, where none of us forget that your satisfaction is the passport to our continued sales and growth."

Richard Roller
Chairman and company founder

NOTES:
Peak amps: Throughout the catalogue, the specifications include reference to peak amps. Please note this is a theoretical calculation of the instantaneous current from a momentary dead short across the battery terminals. It is not representative of the power delivered at the aircraft plug due to cable losses and other factors. This figure is only shown for comparative purposes.

Typical power plant*: Throughout the catalogue, we indicate what power plant each unit is suitable for. This information is given in good faith.

Index of products and services

AC 400Hz Ground Power

PV90-3: in operation at London City Airport

MOBILE OR FIXED, 45 OR 90kVA – POWERVAMP'S WORLD-CLASS AC GPUs

Powervamp is unique in the UK in being both software designer and manufacturer of its industry-leading solid state 400Hz fixed or mobile GPUs, which have been specially designed to meet the sensitive power requirements of today's aircraft.

The company's philosophy is to engineer unparalleled reliability, achieved through the use of premium electrical and electronic components.

- ✓ 45kVA or 90kVA output
- ✓ IP65 all weather controls
- ✓ Large LCD tactile display
- ✓ 12 pulse input rectifier
- ✓ Line drop compensation
- ✓ Tactile keyboard with secret legend
- ✓ IP55 enclosure suitable for outdoor use

PV90-3: Displays of the three output options

Single 400Hz output

Dual 400Hz output

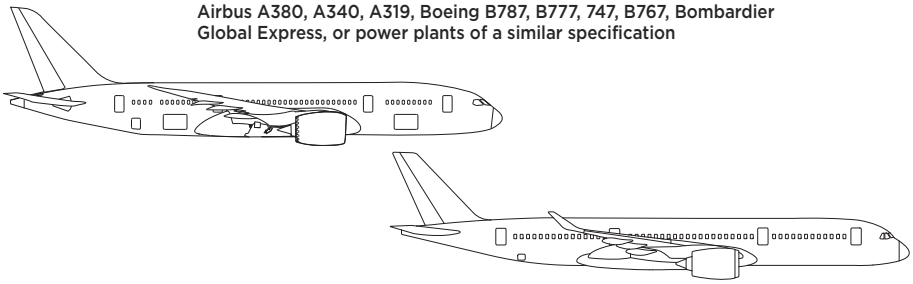
400Hz/28V DC output

PV45

4 x PV90-3 frequency converters in daily operation at Birmingham airport, delivering power to Airbus A380s

PV90-3

Typical power plant:*
Airbus A380, A340, A319, Boeing B787, B777, 747, B767, Bombardier Global Express, or power plants of a similar specification



Delivering a genuine 90kW output, Powervamp's latest PV90-3 converter provides the ground power to run the electrical systems of the Boeing 787 and the next generation of aircraft.

With all power stage components in a single pull-out module – replaceable in minutes – downtime and fault finding are no longer a problem. In the pressured front line operating environment of airports the PV90-3 is a converter that does not require the support of trained technicians. Powervamp's PV90-3 is designed to be a zero downtime GPU requiring a minimum of planned maintenance.

The PV90-3 features an extra large high-definition integrated display with simple controls that allow interrogation of all parameters and functions such as automatic line drop compensation.

The PV90-3's features include connectivity and integration with existing communication platforms supporting a large variety of communication methods which can be used with Powervamp's Monitoring and Billing System (MABS™).

Features

- Unity output power factor 90kVA/90kW
- Pluggable power module for easy first line maintenance
- Stainless steel enclosure as standard
- High quality output suitable for all aircraft
- Low input harmonic distortion (<8%)
- Unique tactile key board with secret legend
- Unique super-large display for instant viewing and operator comfort
- Unique marine IP65 all weather controls
- IP 55 enclosure suitable for outdoor use
- Automatic line drop compensation
- Comprehensive easy-to-use intelligent control panel
- Data logging
- Civil or military use
- RS232, LAN, Bluetooth and GPRS connections

Supplied as standard with:


Hard-wired mains lead

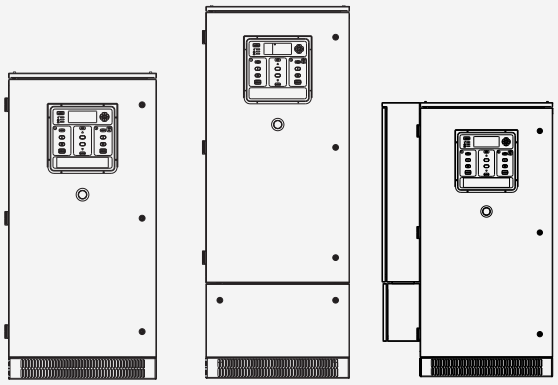

400Hz 6-pin lead

Options

Monitoring and Billing System (MABS™)
Load power metering
Second 400Hz output
28VDC base module
Heavy duty trailer mount
Heavy duty castor mount
Input cable side entry option

See the PV90-3 deployed at the Paris Airshow on our YouTube channel

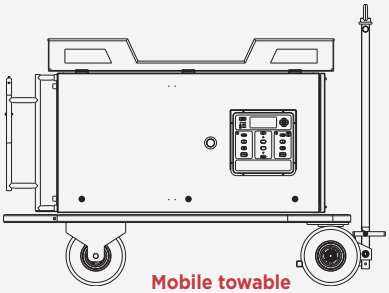
PV90-3: specified to provide ground power at the Paris International Airshow 2015



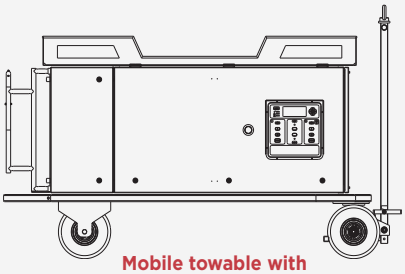
Fixed installation

Fixed installation with base module

Fixed installation with side cable entry



Mobile towable



Mobile towable with 28VDC module

Specifications

Output active power (kW)	90.0
Apparent output power (kVA)	90.0
INPUT	
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
Power factor	> 0.97 @ 100% load
Inrush current	N/A
Maximum input circuit breaker	160A
OUTPUT	
Crest Factor	1.414% ± 0.04
Nominal output voltage	200/115V Three phase + N + E
Voltage regulation	<0.5%
Nominal output frequency	400Hz (+/- 0.01%)
Total harmonic distortion	< 3% (2% typical)
Load power factor	0.7 lagging and 0.95 leading
Voltage modulation	<1%
Phase angle symmetry	120° (+/- 1) for balanced load, 120° (+/- 2%) 30% unbalanced load
Dynamic response	MIL-STD-704

GENERAL	
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
MTBF	100,000 Hrs
MTTR	10 mins

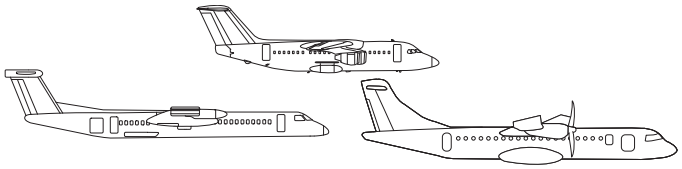
DIMENSIONS

	Height	Width	Depth	Weight
Standard 90 kVA	1450 (57in)	700mm (27.5in)	770mm (30in)	600kg (1323 lbs)
90kVA with 28VDC module (fitted underneath)	1810mm (71in)	700mm (27.5in)	770mm (30in)	800kg (1764 lbs)

STANDARDS	
Safety	EN 62040-1
Emissions	EN 61000-6-3
Immunity	EN 61000-6-2
Specification for 400 Hz aircraft power	DFS400
Aircraft ground support electric supplies	ISO 6858
General requirements for ground support equipment	BS 2G 219
Aircraft electric power characteristics	MIL-STD-704
Ground equipment 400 Hz ground power performance requirement	SAE ARP 5015

PV45

Typical power plant:*
PT6C-67, TPE 331-12, RR Dart 356, RR AE3007A, PW121, PW127, PW150A, ALF 502, CF34B, BR710, or power plants of a similar specification



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

As a manufacturer and exclusive provider of ground power at major air shows, Powervamp's engineers have been uniquely placed to operate the company's converters on all the world's latest generation aircraft, gaining unrivalled data and experience while working alongside the airframe manufacturers' test and field engineers. In this respect Powervamp is unique.

PV45: powering Bombardier CRJ1000

Features

- Mobile
- Heavy duty castors with brake
- High quality output suitable for all aircraft
- 12-pulse input rectifier
- Unique tactile key board with secret legend
- Unique super-large display for instant viewing and operator comfort
- Unique marine IP65 all weather controls
- IP 55 enclosure suitable for outdoor use
- Automatic line drop compensation
- Comprehensive easy-to-use intelligent control panel
- Data logging
- Civil or military use
- Pre-fitted input cable with 63A plug
- Pre-fitted output cable with aircraft connector

Supplied as standard with:


Hard-wired mains lead


400Hz 6-pin lead


2 x locking casters

Options

Fixed installation plinth
External swipe card Input
Extended input cable
Extended output cable

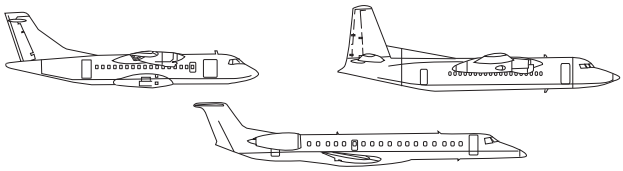
Specifications

Output active power (kW)	36.0
Apparent output power (kVA)	45.0
INPUT	
Number of phases	3
Nominal input voltage	400V 3 Wire + E (+ / - 10%)
Nominal input frequency	50 / 60Hz (+ / - 10%)
Rectification topology	12 Pulse
Current distortion	< 15% @ 100% load
Power factor	> 0.97 @ 100% load
Inrush current	N/A
Maximum input circuit breaker	63A
OUTPUT	
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
DIMENSIONS	
Dimensions	H 1060mm (42in) W 610mm (24in) D 915mm (36in)
Weight	345kg (761lbs)

See website for full specification datasheet

TRU 2400-2

Typical power plant:*
PT6C-67, Makila, TFE 731, ALF 502, HTF7000, RR Tay, or power plants of a similar specification



Powervamp's TRU 2400-2 transformer rectifier unit will start and power all known 28V DC aircraft.

Silent, environmentally clean, and easy to use, the TRU-2 offers users significant operating benefits.

Designed and built to the highest industry standards (MILSTD 704, ISO 6858), it produces the highest quality output signal with minimal AC ripple and is guaranteed to be accepted by all DC aircraft.

The 12 pulse rectification technology used ensures a low input total harmonic distortion less than 13% at nominal load, adding to the efficiency of the system.

The TRU 2400-2 produces a regulated 28V DC output and can deliver a constant current of 600A with engine starting peaks of up to 2400A. The current limiting feature enables the user to limit the output current to the aircraft and can be accessed and set via the digital display. The user can access the line drop compensation feature via the display menu to increase/decrease the output voltage at the plug within the limits of ISO 6858.

The TRU 2400-2 is a compact solid state module built to IP55 protection, designed for internal/external fixed or mobile use. With its weather-resistant, hot-dipped galvanized frame with wheels, the unit can be easily moved by hand over uneven surfaces.

Power consumption is reduced by the unique 'wake/sleep' feature which powers down the TRU 2400-2 after sensing that there has been no current draw for a pre-set time.

Features

- Low total input harmonic distortion
- Digital display
- Unique energy-saving sleep mode controlled via the display
- System data logger
- Indoor/outdoor hangar use
- Line drop compensation
- External system control (option)
- Emergency power off
- Aircraft interlock/system interlock override
- Input frequency and voltage monitoring
- Output current limit feature
- Braking system
- Input and output cable storage

Supplied as standard with:

4m x 70mm² hard-wired Nato plug lead

2 x locking casters

Large, backlit control panel

Specifications

Output power	16.8kW
INPUT	
Voltage	400 VAC / 208 VAC (3Wire+E)
Frequency	50/60 Hz
Rectification	12 pulse
Inrush current	N/A
Power factor	> 0.86 @ nominal load
Line current	32A / 62A @ nominal load
Input harmonics	<12% @ nominal load
OUTPUT	
Voltage	28 V DC
Current	600 amps continuous
Engine start capacity	2400 A selectable
Ripple	Less than 1% at full load
Line drop compensation	up to 15%
DIMENSIONS	
H 875mm (35in) W 837mm (33in) D 653mm (26in)	
Weight	230kg (507lb)

See website for full specification datasheet

Cable Carrier System

SIDEWINDER
– THE ULTIMATE CONVERTER-TO-AIRCRAFT POWER TRANSFER SYSTEM

Aircraft power cabling and plugs are subjected to extremes of wear, impact damage and rough handling.

As a result, power cables and AC plugs are a constant source of problems at busy airports, with any failure potentially having an impact on safety, turn-round times and costs.

Powervamp's Sidewinder cable carrier system is engineered to give airports a simple, reliable power transfer system at an affordable price, backed by Powervamp's unique five-year Sidewinder warranty.

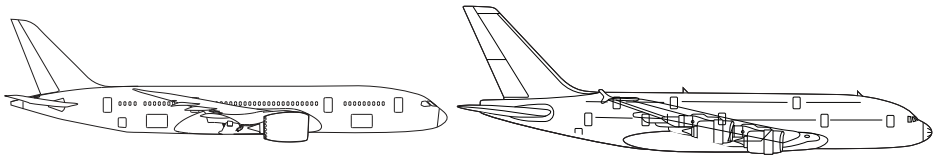
Installed at a number of major UK airports, this proven system offers the ultimate in power transfer from converter to aircraft.

"With Sidewinder, Powervamp has covered all the issues that are troublesome with the existing cable carriers. Its low rolling resistance makes it easy for the ground handlers to deploy, and the modular design certainly makes maintenance a simple job for our engineers. There is no doubt Sidewinder is appreciated by the ground handlers, airline and maintenance staff"

Sharif Hameed BEng (Hons)
Contract Manager for Land & Airside Engineering, Heathrow Airport Ltd.

Sidewinder®

Typical aircraft:* **Airbus A380, A340, A319, Boeing B787, B777, 747, B767, or power plants of a similar specification**



Compared with any other type of cable carrier, Sidewinder has the lowest life cost of ownership, achieved through key design features such as:

- high quality low rolling resistance castoring wheels
- special steel drag link chain beam pivots
- modular sub-assemblies
- quick release connectors
- quick access beams and chains
- 1, 2, 3 or 4 x 90kVA outputs

Powervamp has considered all aspects of Sidewinder deployment – from initial transport and installation to ease of operation and field service – and has worked directly with ground handling teams at major UK airports to understand their problems.

Sidewinder: specified by London Heathrow Airport

Specifications

Beam construction	2mm stainless steel, with welded overlap
Beam length	2650mm
Beam height	168mm
Beam width	107mm
Deployment length (infeed box to basket)	12m, 18m, 24m
Output cables from basket	6m
Overall stowed footprint, 3 beam	W 3420mm (135in) x D 3410mm (134in)
Max working radius	180 degrees
Wheel diameter, standard	100mm 'D' profile tyre (optional 150mm, 200mm)
Basket dimensions	W 1032mm (41in) D 905mm (36in) H 860mm (34in)
Installation bias	Left or right extension depending on assembly
Drag link	Tensile steel links and pins with alloy vertical post modules
Forward control cabinet	Stainless steel IP65 rated
Forward control buttons	400hz on/off/ Interlock on/off monitoring options
Brake system	Basket mounted double stamp locks with frame mounted back-up locks
Weight	815kg (4 cable, 15 metre version)
Certification: ISO 9001:2008 – Independent power supplies for aerospace SAE-ARP 5015, 2011 – 01 400HZ ground power performance requirement	

See video of the Sidewinder in operation on our YouTube channel

UNIQUE MODULAR DESIGN

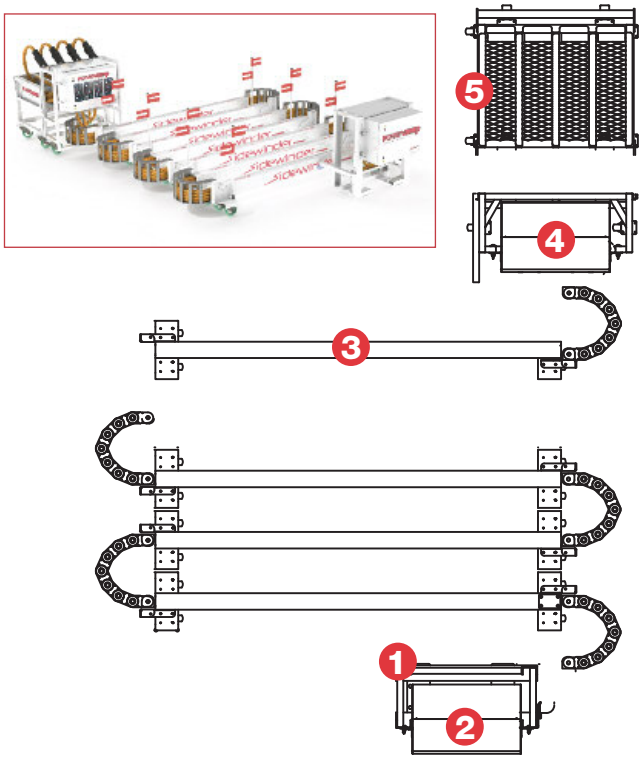
FOR RAPID SWAP-OUT AND UPGRADING

Sidewinder's unique design enables airports to modify an installed unit to accommodate stand upgrades or aircraft changes. Anchor holes for securing the beam are compatible with most other products allowing rapid swap-out and upgrade without the need to obtain permits or carry out major groundworks.

SIDEWINDER COMPRISES THE FOLLOWING MODULES:

1. **Beam anchor with distribution box mount**
2. **Distribution box** designed for 1, 2, 3 or 4 x 90 kVA cabling
3. **Chain/beam modules** available in increments of 3.5m
   Minimum length: 14m (4 beams)
   Option: Length increases in increments of 3.5m to maximum extension 8 beams (approx 30m)
4. **Front end control box** with bus bar options for 1, 2, 3 or 4 x 90 kVA outputs and connection to 28v DC module*
5. **Quick detachable cable basket**:
   Standard 2 compartments, (optional 4 compartments), each stows up to 6m of cable with stainless steel holster

* Due to voltage drop at high amperages, a separate DC module connected to the AC 400Hz output at the basket end is recommended where long cable runs are required.



Sidewinder can be powered by all 400Hz GPUs, including Powervamp's PV90-3 fixed or mobile 90kVA 400Hz GPUs seen in operation here

RAMP CARTS and PORTABLE AIRCRAFT START UNITS

Selecting the correct model of aircraft start unit can sometimes be a confusing task. It's essential that the unit you select for starting turbines and for providing sufficient power for pre-flight checks, provides the performance and product lifespan that you need.

The following checklist has been specifically designed to assist Powervamp customers with their aircraft start unit selection. And of course, Powervamp's technical support department or appointed distributors will also be pleased to offer advice in helping you select the correct GPU.

Is the pack for emergency use only?

A GPU with minimum capacity may be sufficient, as it is unlikely to encounter intense usage.

✓ **Recommended: Powervamp GPU 1700**

Will the pack be carried on board?

You'll need to consider the weight of the unit, but beware of reducing weight at the cost of performance.

✓ **Recommended: Coolspool 17**

Will the GPU be used for programming/pre-flight checks before spool-up?

Allow additional amp/hr capacity to ensure a cool start.

✓ **Recommended: GPU 2400**

Will the GPU be used as the main ramp/hangar GPU on multiple operations?

It's best to extend the GPU life with extra amp/hr capacity.

✓ **Recommended: Coolspool ramp cart range (for better long-term value)**

Is the GPU required for regular compressor washing?

It's likely the battery will need replacing regularly if using a small pack.

✓ **Recommended: Coolspool 260**

Selecting the correct unit

Will the GPU be used for regular avionics or maintenance work?

Batteries are not designed for continuous powering. Consider a GPU with an internal power supply.

✓ **Recommended: Coolspool cart range or GPU1500/40**

Does the GPU need to operate between FADEC upper/lower voltage limits?

✓ **Recommended: Coolspool 410 (26V version)**

Is continuous power required for maintenance or training?

Use a GPU with internal power supply or use power supply in parallel to prevent premature battery replacement.

✓ **Recommended: PS100**

How many engine starts are required before the GPU can be re-charged?

Remember: starts require amp/hr capacity to maintain volts. More starts require more amp/hr capacity and more weight, and therefore a larger size.

✓ **Recommended: Coolspool 410**

Is engine free turbine or shaft turbine/turboprop?

Longer spool-up times of shaft turbines will require more amp/hr capacity.

✓ **Recommended: GPU1400/40**

NOTE

Selecting any portable GPU is not an exact science. It is a compromise between weight, size, necessary performance, recharge time, battery life and price. It should be noted that the life of the GPU is dependent on the level of discharge each time the GPU is used. The deeper the discharge, then the sooner will be the time when batteries need replacing. Where possible it is always preferable and more cost effective to buy a GPU with the maximum amp/hr capacity.

28V DC Ramp Carts

Coolspool 410: powering an ATR-72/600

HIGHLY EFFICIENT, LOW-COST RAMP/HANGAR POWER – THE 28V DC COOLSPOOL RAMP CARTS

The award-winning Coolspool range of 28V DC battery carts are a cost saving, environmentally-friendly alternative to diesel GPUs.

Where no AC 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 important environmental considerations.

With the price of diesel increasing and stricter legislation on noise and CO2 emissions, the advanced technology Coolspool battery cart range is the way forward for regional and feeder airlines' FBOs and ground handling agents under pressure to reduce direct operating costs.

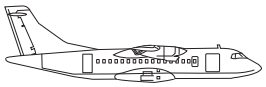
Powervamp's large 28 volt Coolspool battery cart GPUs are increasingly being used to provide the smooth 28 volt DC power required for pre-flight checks, avionics programming or maintenance. They are ideal for crew training, aircraft turnround/cabin cleaning at remote airport stands (where power can be required for anything from a few minutes to several hours) or where noise curfews or the lack of any electrical supply prohibit any other method of powering the aircraft's DC systems.

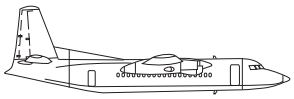
Coolspool 260: in operation with the Eurocopter EC135

Coolspool 130

Coolspool 260

Typical power plant:*
Coolspool 130: PT6A-27, Makila, TPE 731, GE T700, AE3007, CF34, or power plants of a similar specification
Coolspool 260: PT6C-67, Makila, TFE 731, ALF 502, HTF7000, RR Tay, or power plants of a similar specification





COOLSPOOL 130 AND COOLSPOOL 260

The Coolspool 130 and 260 28V DC battery carts are designed to suit the requirements of a range of applications, from small corporate jet and medium size helicopter operators and FBOs to large fleet operators or FBOs supporting multiple DC business aircraft and requiring more capacity for frequent starts, compressor washes or avionics use.

A combination of high-discharge maintenance-free batteries, each of 130 Ah capacity are connected in series to provide 130 Ah capacity. Where increased capacity is required, the cart design allows a second set of batteries to be connected in parallel, thereby doubling the capacity to 260 Ah.

The Coolspool 130 and 260 are available in two nominal output voltages, 26V DC or 28V DC, to cater for variations in upper Fadec limits, which vary according to the manufacturer's software.

All models of cart are fitted as standard with an internal 75A quick-demountable charger/power supply module providing rapid recharge of batteries. Switching from 'charge mode' to 'aircraft mode' allows up to 75A of continuous power to the aircraft for extended avionics use and software updates.

The Coolspool range of battery carts is now recognised worldwide for the massive financial savings in fuel and maintenance they deliver to operators who have replaced diesel GPU's with these silent maintenance and pollution free rechargeable mobile battery carts.

Features

Coolspool 130, Coolspool 260:

- High powered sealed lead acid AGM batteries
- Cleared for air transportation
- 75A, 28V DC internal power supply/charger
- Charging/charge complete LED indicators
- 'Aircraft Mode' switch for continuous 28V power to aircraft
- Corrosion resistant galvanized frame with aluminium panels
- Removable tow arm
- Pneumatic tyres
- Spare wheel, fitted to cover
- Aircraft cable with heavy-duty Nato connector
- Harsh environment input cable with plug
- Heavy-duty output isolator with replaceable contacts
- Security 'R' clip isolator lock
- Solid state voltmeter/ammeter with 'push to view' feature

See p. 18 for technical specifications

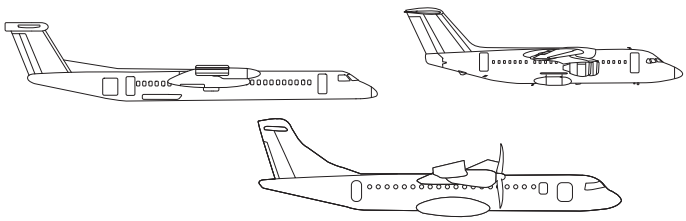
Supplied as standard with:

4m x 70mm2 hard-wired Nato plug lead

Spare wheel

Coolspool 410

Typical power plant:*
Coolspool 410: DC regional jets and turboprop airline operations PT6C-67, TPE 331-12, RR Dart 356, RR AE3007A, PW121, PW127, PW150A, ALF 502, CF34B, BR710, or power plants of a similar specification



COOLSPOOL 410

The Coolspool 410 28V DC battery cart is designed for use on DC regional jets and DC turboprop aircraft in scheduled airline services. Using maintenance-free ultra-high-discharge TPVRLA (thin plate valve regulated lead acid) batteries, the Coolspool 410 delivers the combination of instant high amps for starting with the key feature of guaranteed pure DC waveform, essential for the highly sensitive electronics on some modern DC aircraft.

The Coolspool 410 battery cart has proved itself as a direct replacement for diesel ground power at the ramp. Operating at a fraction of the cost of a diesel GPU, the Coolspool 410 delivers huge cost savings for airlines.

Its zero carbon footprint and noiseless operation also benefit operators with its environmental and marketing advantages, while its total silence significantly improves the working conditions of ramp personnel through the absence of fatiguing noise.

With its low initial capital investment and very low operating costs, the Coolspool 410 has proved to be the perfect GPU where new destinations or infrequent services demand cautious investment.

The simplicity of operation and lack of maintenance makes the Coolspool 410 ideal for use at smaller airports, where gate agents or airline personnel often perform multiple tasks.

At major hubs, a regional airline with multiple departures using the Coolspool 410 as the source of its ground power can expect to experience substantial annual fuel and maintenance savings.

Features

Coolspool 410:

- High powered sealed lead acid AGM batteries
- Cleared for air transportation
- 75A, 28V DC external charger with harsh environment input cable and plug
- Engine start counter
- Roof-mounted ‘Power On’ beacon with low voltage alarm
- Corrosion resistant galvanized frame with aluminium panels and mudguards
- Roof-mounted cable storage container
- Cold weather protection/anti-cold soak insulation
- Foot operated parking brake
- Pneumatic tyres
- Rear suspension
- Replaceable side and rear bumpers
- Spare wheel (supplied loose)
- Aircraft cable with heavy-duty Nato connector
- Heavy-duty output isolator with replaceable contacts
- Security ‘R’ clip isolator lock
- Solid state voltmeter/ammeter with ‘push to view’ feature

See p. 18 for technical specifications

Supplied as standard with:


4m x 70mm2 hard-wired Nato plug lead


Wheel brake system


Beacon light


BC80 external fast charger

Coolspool 410: in operation on CASA 235

Coolspool 410: in operation with ATR72-600

Specifications

	Coolspool 130	Coolspool 260	Coolspool 410
Peak amps	4000A	8000A	4700A
Nominal voltage	26V or 28V DC depending on model		
Standing voltage	27.8V DC or 30V DC depending on model		
Amp/hour capacity	130 Ah or 260 Ah @ 10 hr rate (20°C)		410 Ah @ 10 hr rate (20°C)
Operating temp	-40°C to +50°C (-40°F to + 122°F)		
Case	Galvanised steel frame with alloy panels		
Voltmeter/Ammeter	Solid state LED, IP65		
Aircraft cable	4m (13ft) with heavy-duty rubber Nato connector		
Output current	75A @ 28V DC (aircraft mode)		
Charger	75A 2-stage internal charger (charge mode)		75A 2-stage external charger (BC80)
Input voltage	180-264V AC/47-63Hz		180-264V AC/47-63Hz/single phase (BC80)
Input current	16A @ 230V AC, 20A @ 180V AC/single phase (typical)		See BC80 below
Input cable	3m with 16A 3 pin 6h blue plug		See BC80 below
Cooling	Forced ventilation (internal power supply)		See BC80 below
Tow eye dimensions	50mm (2in) for occasional/low speed towing		
Dimensions	H 801mm (32in) L 1270mm (50in) W 782mm (31in)		H 950mm (37in) L 1500mm (59in) W 812mm (32in)
Weight	157kg (346lbs)	270kg (595lbs)	500kg (1,102lb)
NGAGE	KD628		

	External BC80 Charger (Coolspool 410 only)
Type	75A 2-stage external charger 180-264V AC/47-63Hz/single phase
Input current	16A @ 230V AC 20A @ 180V AC/single phase (typical)
Input cable	1m with 16A 3 pin 6h blue plug
Cooling	Forced ventilation
Protections	Thermal, current overload, short circuit, over voltage
Dimension	L 435mm (17in) W 135mm (5in) H 340mm (13in)
Weight	11kg (24lb)

Coolspool 130: powering AS332 Super Puma

Coolspool 410: powering an ATR 42-500

28V Mini Diesel (Hybrid)

Coolspool Hybrid 300: starting both turbines on the Augusta Westland AW139

Coolspool Hybrid 300

COMPACT, VERSATILE, CONVENIENT – THE COOLSPOOL HYBRID 300

Powered by a 3-cylinder water-cooled Kubota diesel engine, the Coolspool Hybrid 300 is the latest model of Powervamp's compact low cost diesel GPU.

It is designed for regional DC aircraft operators and FBOs requiring continuous ripple-free power in the hangar and remote power for line operations and turbine starting on the ramp.

No other GPU delivers the versatility and convenience of Powervamp's Coolspool Hybrid 300.

This compact and efficient diesel GPU provides continuous DC power and an auxiliary AC single phase output. Very high DC amperage from its ultra-high-discharge batteries is available instantly for turbine starts and short-term loads that may exceed the generator's continuous output.

The Coolspool Hybrid 300 was originally developed in 1995 for the UK military as a low cost self-contained GPU designed to supply continuous DC power all day for pre-flight/avionics and random turbine starting.

The latest generation Coolspool Hybrid 300 delivers up to 300A continuously at 28V, either from the diesel generator or by connecting the GPU to a 3-phase mains supply, thereby allowing it to be used in confined spaces.

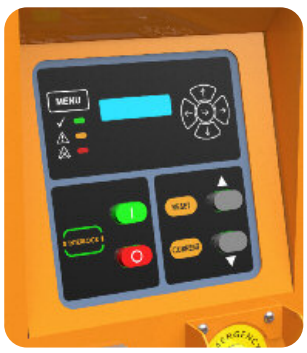
A selector switch allows the user to select Generator or Mains mode, enabling the GPU to provide power from the Generator or the Mains input.

In enclosed spaces such as maintenance shops or hangars, with the diesel engine shut down and the unit connected to a mains supply, the Coolspool Hybrid 300 while providing 28V, will automatically recharge its integral batteries.

Available In various configurations and in series production over 17 years, with sales to several armed forces, the latest Coolspool Hybrid 300 is the civil version for FBOs, regional airlines, and operators requiring versatile remote power at a fraction of the cost of a conventional diesel GPU.

Supplied as standard with:

- 228 amp/hr high discharge VRSLA batteries (other options available)
- 4-metre (13ft) double insulated DC output cable with heavy-duty rubber nato plug
- Frame manufactured from hot dip galvanised steel channel and square hollow section. Alloy side panels finished in yellow powder coat paint with nonferrous/stainless steel fittings
- Stainless steel 33-litre (7 gallon) fuel tank with purge drain tap for air transportation
- Spare wheel



Backlit control panel

Typical power plant:*
Coolspool Hybrid 300: DC regional jets and turboprop airline operations PT6C-67, TPE 331-12, RR Dart 356, RR AE3007A, PW121, PW127, PW150A, ALF 502, CF34B, BR710, or power plants of a similar specification. All regular line ops, 30–80 seat airline DC turboprops, Mil transports. Regional airports, FBOs, pre-flight and start (assumes Coolspool Hybrid 300 batteries fully charged)

Features

- High powered sealed lead acid AGM batteries
- Cleared for air-transportation
- 300A, 28V DC internal power supply/charger
- Corrosion resistant galvanised frame with aluminium panels
- Shore capacity for silent, clean aircraft maintenance supply within hangar
- Ability to recharge external ground power units via power outlet
- Reverse polarity protection
- Reverse current protection
- Complies with ISO 6858

Specifications

Peak amps	5000A
Nominal voltage	Batteries 24V DC/power supply 28V DC
Standing voltage	25.6V DC
Amp/hour capacity	228Ah (other options available)
Operating temp	-30°C to +50°C (-22°F to 122°F)
Case	Galvanised steel frame with alloy panels
Control panel	LCD screen provides detailed information of different parameters. Large rubber ON/OFF buttons for easy operation
Aircraft cable	Different options available: 4m (13ft), 6m (20ft) and 8m (26ft) with heavy-duty rubber Nato connector
Output current	300A continuous
Input voltage	190–200V AC or 380–415V AC / 50–60Hz (only in Mains mode with the engine turned Off)
Input current	32A @ 400V AC; 32A @ 200V AC/ 3-phase (only in Mains mode with the engine turned Off)
Cooling	Forced ventilation
Forklift points	2 forklifting points on both sides
Fuel type	Diesel
Fuel tank capacity	33 litres (7 gallons)
Aux output	115V AC 60Hz / 230V AC 50Hz
Dimensions	L 1900mm (75in) W 970mm (38in) H 1130mm (45in)
Weight	538kg (1186lb) for a dry unit with 4m output cable
NGAGE	KD628

DC Aircraft Start Units

GPU 2400 Twin:
starting Lynx Wildcat

WORLD-LEADING GROUND POWER UNITS – PERFORMANCE, RELIABILITY, EASE OF SERVICING

Powervamp's range of tough, competitively-priced hand-portable aircraft start units and GPUs are world-renowned for their performance, reliability and ease of servicing.

Coolspool 17: EC130 preflight and start

The Twin Pack concept – pioneered by Powervamp

Small size and low weight are important requirements for hand-portable aircraft start units. There are times when you need additional battery capacity and performance, but you still want to retain the essential benefits of mobility or hand-portability in your units.

The solution, pioneered by Powervamp more than 20 years ago and now adopted throughout the industry, is to connect two aircraft start units in parallel by a plug-in polarized heavy-duty cable, instantly doubling the battery capacity for increased starting capability.

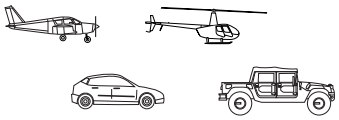
All twin units can be conveniently separated for ease of transport, and are designed to be carried on board for emergency power or turbine starting.

Using an optional second Nato plug lead set, the units can be deployed individually, or connected together where an aircraft requires a parallel start.

GPU 1700: Chinook line maintenance

12V GA Pack

Typical power plant:*
12V GA Pack: Only for 12 volt aircraft. 12V diesel to 3 litres (180 cu in)



Both the 12V GA Pack and 12/24V GA Pack are high-powered, tough, budget-priced units, sharing many of the key features and featuring the same high-quality, high-discharge batteries as used in Powervamp's premium aviation product range.

12V GA PACK

The 12V GA Pack is an entry-level 12V DC general aviation aircraft start unit. It is designed for the regular starting of 12V DC piston aircraft and helicopters as well as 12V diesel cars, 4x4s and pickups with engines up to 3 ltr/180 cu in.

The powerful dry-cell battery is isolated via the internal 500A key switch allowing the start unit to be cleared for air transportation.

The 12V GA Pack is supplied with an external 4A charger and two lead sets for both aircraft and automotive applications.

12/24V GA PACK

The 12/24V GA Pack is designed for the private owner and general aviation operator. Ideal for smaller turbine aircraft and helicopter operators, all piston aircraft, or where the starting of 24V trucks and 12V vehicles is also a requirement.

The powerful dry-cell batteries are isolated via the internal 500A key switch allowing the aircraft start unit to be cleared for air transportation. An externally mounted 750A fuse offers protection against excessive use or a dead short across the output cables.

The impact resistant polyethylene case allows the start unit to sit in snow or flooded sites up to 300mm (12in) deep without water ingress.

The solid state LED displays on both the 12V GA Pack and 12/24V GA Pack show battery status when the pack is switched on. An audible reverse polarity alarm warns against incorrect connection.

12/24V GA Pack

Typical power plant:*
12/24V GA Pack: Arrius, Rolls-Royce 250, PT6A-27. Continental and Lycoming piston. Grumman American GA-7 Cougar. 24V diesel to ten litres (600 cu in), or power plants of a similar specification

Features

12V GA Pack and 12/24V GA Pack:

- High powered sealed lead acid AGM battery
- Cleared for air transportation
- External charger with LED status indicator
- 3 LED battery charge status
- Fully insulated colour-coded alligator clip leads for direct battery connection
- Tough polyethylene case
- Audible reverse polarity warning buzzer
- Voltage spike protection
- Switched USB socket for mobile phone/tablet charging
- Output key switch isolator

12V GA Pack only

- Aircraft cable with Piper connector
- Auxiliary socket for charging and plug-in accessories

12/24V GA Pack only

- Aircraft cable with heavy-duty Nato connector
- External 750A output fuse

Specifications

	12V GA Pack	**12/24V GA Pack**
Peak amps	2400A	2400A
Nominal voltage	12V DC	12V/24V DC
Standing voltage	12.8V DC	12.8V and 25.6V DC
Amp/hour capacity	26 Ah @ 10 hr rate (20°C)	
Fuse rating	–	750A
Operating temp	-40°C to +45°C (-40°F to +113°F)	
Case	Moulded impact resistant polyethylene	
Aircraft cable	2m (6ft) Piper plug lead set	2m (6ft) aircraft cable with Nato connector
Automotive cable	2m (6ft) lead set with 500A alligator clip leads	2m (6ft) lead with 1000A alligator clip leads
Charger	4A 3-stage external charger/ 110–230V AC/50–60Hz/single phase	10A 3-stage external charger/ 110–230V AC/50–60Hz/single phase
Dimensions	H 355mm (14in) L 180mm (7in) W 150mm (6in)	H 570mm (22in) L 180mm (7in) W 160mm (6in)
Weight	12kg (26.4lb)	25kg (55lb)
NCAGE	KD628	

Supplied as standard with:

BOTH MODELS:


Country-specific input cord(s)


2m alligator clip leads


USB socket

PLUS, FOR 12V PACK ONLY:


2m Piper lead


12V 4A external charger

PLUS, FOR 12/24V PACK ONLY:


2m Nato plug lead


12V 10A external charger

Options

Both models: On-board charging kit; 2m Nato plug lead; 4m alligator clip leads, 4m Nato plug lead, 4m Piper lead

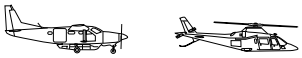
12V Pack only: 2m Nato plug lead

12/24V Pack only: GA Pack trolley, 2m Piper lead; 24V inspection lamp

12/24V GA Pack: powering Cessna 172R

GPU 1700

Typical power plant:*
GPU 1700: PT6A-27, TFE 331, Arriel, Williams FJ33, GE H80, or power plants of a similar specification



GPU 1700 AND GPU 2400

In continuous production for more than 20 years, and in military use worldwide, the recently upgraded GPU 1700 and GPU 2400 aircraft start units use a tough, corrosion resistant, all stainless steel case designed for use in extreme environments.

The units are designed to take the heavy abuse that occurs with frequent transportation by road or air and their flush sides and buttressed full-length handles prevent snagging in confined spaces.

A heavy-duty push/pull isolator switch with replaceable copper contacts ensures maximum power transfer with minimum voltage drop. The lockable 'R' clip ensures the aircraft start unit is cleared for air transportation.

These aircraft start units are designed to be carried on board for emergency power or turbine starting and are fitted with dual 12V DC automatic 3-stage internal chargers for maximum cell longevity. Suitable for starting all APUs and medium size free turbines.

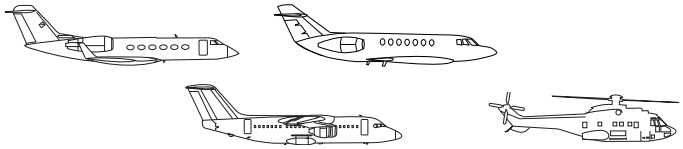
GPU 1700 TWIN AND GPU 2400 TWIN

In use worldwide, the GPU 1700 Twin and GPU 2400 Twin packs are recognized by relief agencies operating in extreme environments as the best portable aircraft start units for DC aircraft and helicopters requiring a 24V DC or external 24/48V DC parallel/series start.

The twin units provide 64 Ah (GPU 1700 Twin) or 86 Ah (GPU 2400 Twin) for increased starting capability. With the use of an optional second Nato plug lead set, they can be deployed individually or used where an aircraft requires a parallel start, and will also start all APUs and large free turbines.

GPU 1700 Twin

Typical power plant:*
GPU 1700 Twin: Makila, PT6-67, Arriel, LF 507, PW 305A, PW 308, or power plants of a similar specification



Features

All models:

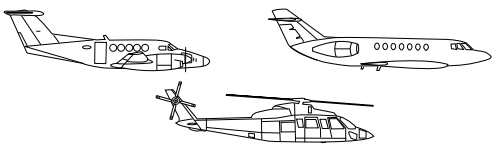
- High powered sealed lead acid AGM batteries
- Cleared for air transportation
- Internal chargers with LED status indicators
- All-welded stainless steel case with removable back panel
- Controls protected by full length handle with reinforced side buttresses
- Aircraft cable with heavy-duty Nato connector
- Heavy-duty output isolator with replaceable contacts
- Security 'R' clip isolator lock
- Auxiliary socket for charging and plug-in accessories
- Solid state voltmeter
- Fitted with rubber anti-slip, shock absorbent feet
- Heavy-duty padded jacket

GPU 1700 Twin and GPU 2400 Twin only:

- Double trolley and parallel joining connector

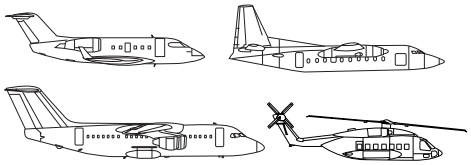
GPU 2400

Typical power plant:*
GPU 2400: Williams FJ-33, Arrius, ALF 502, or power plants of a similar specification



GPU 2400 Twin

Typical power plant:*
GPU 2400 Twin: ALF 502, TPE 331, TFE 331, TFE 731, PW Twin Pack, Makila, PW120, PW305A, or power plants of a similar specification



Supplied as standard with:

ALL MODELS:


Country-specific input cord(s)


2m Nato plug lead


Padded protective jacket(s)

PLUS, FOR TWIN PACKS ONLY:


Double trolley


Parallel joining connector

Options

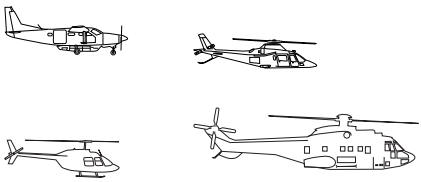
All models: 2m alligator clip leads
4m alligator clip leads
4m Nato plug lead
24V 10A external fast charger
24V inspection lamp
Single packs only: Universal single trolley

Specifications

	GPU 1700	GPU 1700 Twin	GPU 2400	GPU 2400 Twin
Peak amps	1700A	3400A	2450A	4900A
Nominal voltage	24V DC			
Standing voltage	25.6V DC			
Amp/hour capacity	32 Ah @ 10 hr rate (20°C)	64 Ah @ 10 hr rate (20°C)	43 Ah @ 10 hr rate (20°C)	86 Ah @ 10 hr rate (20°C)
Operating temp	-40°C to +50°C (-40°F to +122°F)			
Case	Welded, non-magnetic stainless steel			
Voltmeter	Solid state LED, IP65			
Aircraft cable	2m (6ft) with heavy-duty rubber Nato connector			
Internal charger	2 x 12V, 2.3A 3-stage/ 90–264V AC/47–63Hz/single phase	4 x 12V, 2.3A 3-stage	2 x 12V, 2.3A 3-stage	4 x 12V, 2.3A 3-stage
Dimensions	H 465mm (18in) L 340mm (13in) W 110mm (4in)	H 1120mm (44in) L 555mm (21in) W 465mm (18in)	H 475mm (18in) L 440mm (17in) W 110mm (4in)	H 1120mm (44in) L 555mm (21in) W 465mm (18in)
Weight	25kg (55lb)	61kg (134.4 lb) including trolley	34kg (75lb)	85kg (191lb) including trolley
NSN	2990-99-930-3147	2990-99-789-1831	2995-99-230-9194	
NGAGE	KD628			

GPU 1500/40

Typical power plant:*
GPU 1500/40: PT6-27, Arriel, Williams FJ33, GE H80, or power plants of a similar specification



GPU 1500/40

Originally developed in 2001 to provide continuous power for avionics use and for starting medium sized helicopters and Air-Force PT6 turbine EMB110 Bandeirante aircraft, the GPU 1500/40 only weighs 26kg (57lbs), yet incorporates an internal 40A continuous 28V DC output using split 20A power supplies.

Each GPU is supplied with a power supply LED output monitor for load monitoring and diagnostics, and can be re-charged via its accessory port by any 24–28V DC aircraft power source, including the aircraft 28V DC bus connector.

GPU 1500/40 TWIN

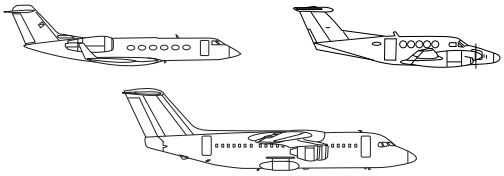
The modular design allows easy swap out and field servicing and also allows two GPUs to be paralleled together, creating the GPU 1500/40 Twin.

The Twin is suitable for starting larger helicopters and business jets where larger turbines or turboprop aircraft require higher instant amperage and longer start cycles. It will deliver 80A continuous output when connected to AC power and is ideal for lengthy pre-fight checks.

The units are fitted with solid state voltmeter with 'push to view' button to monitor battery voltage. A spring-loaded output cover ensures each unit is cleared for air transportation. They are supplied with Nato plug lead set, input lead and heavy-duty padded jacket.

GPU 1500/40 Twin

Typical power plant:*
GPU 1500/40 Twin: TPE 331, PT6-67, Makila, TFE 731, LF 507, CF 34, PW 120, PW 308, or power plants of a similar specification



Features

GPU 1500/40 and GPU 1500/40 Twin:

- High powered sealed lead acid AGM batteries
- Cleared for air transportation
- Power supply LED status indicator
- Corrosion resistant aluminium case with carry handle
- Controls protected by twin front protection bars
- Spring-loaded output connector cover
- Auxiliary socket for plug-in accessories
- Solid state voltmeter with 'push to view' feature
- Fitted with rubber anti-slip, shock absorbent feet
- Heavy-duty padded jacket

GPU 1500/40 only:

- 40A, 28V DC Internal power supply/charger

GPU 1500/40 Twin only:

- 80A, 28V DC Internal power supply/charger
- Double trolley

Specifications

	GPU 1500/40	GPU 1500/40 Twin
Peak amps	2400A	4800A
Nominal voltage	Batteries 24V DC/power supply 28V DC	
Standing voltage	25.6V DC	
Amp/hour capacity	26 Ah @ 10hr rate (20°C)	52 Ah @ 10 hr rate (20°C)
Operating temp	-40°C to +45°C (-40°F to + 113°F)	
Case	Aluminium with shock absorbing feet	
Voltmeter	Solid state LED, IP65	
Aircraft cable	2m (6ft) with heavy-duty rubber Nato connector	
Output current	40A (with internal power supply)	80A
Input voltage	100–132V AC or 200–264V AC/45–400Hz single phase	
Charger	2 x 20A internal power supplies	4 x 20A internal power supplies
Input current	8A @ 230V AC 16A @ 115V AC / single phase (typical)	
Input voltage	100–132V AC or 200–264V AC/45–400Hz single phase	
Cooling	Forced ventilation	
Dimensions	H 340mm (13in) L 400mm (15in) W 140mm (5in)	H 1100mm (43in) L 500mm (19in) W 560mm (22in)
Weight	26kg (57lbs)	64kg (117lbs) (inc. trolley)
NSN	2990-99-6117404	
NGAGE	KD628	

Supplied as standard with:

BOTH MODELS:


Country-specific input cord(s)


2m Nato plug lead


Padded protective jacket(s)

PLUS, FOR GPU 1500/40 TWIN ONLY:


Aviation double trolley


Parallel joining connector

Options

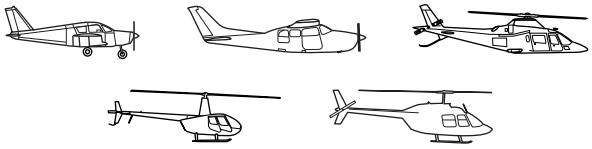
Both models: 4m Nato plug lead; 24V inspection lamp

Single packs only: Universal single trolley

GPU 1500/40 Twin: powering Super Puma

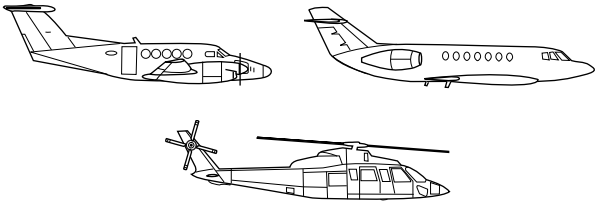
Coolspool 17

Typical power plant:*
Coolspool 17: Arrius 2F, Rolls-Royce 250, or power plants of a similar specification



Coolspool 29

Typical power plant:*
Coolspool 29 and 29 Twin: TPE 331, PT6-67, Arrius, or power plants of a similar specification



The Coolspool 17, Coolspool 29 and Coolspool 29 Twin are available in two versions, offering two nominal output voltages, 26V DC or 28V DC, to cater for the variation in upper FADEC limits which vary according to the manufacturer's software.

COOLSPOOL 17

The Coolspool 17 is used extensively on light/medium turbine helicopters or aircraft and all 24V DC piston diesel/Avgas engines. When connected in parallel with Powervamp's PS30M DC power supply, both units deliver a unique lightweight combination of performance and versatility.

COOLSPOOL 29 AND COOLSPOOL 29 TWIN

The Coolspool 29 is designed for larger twin turbine aircraft and helicopters where additional amp/hour capacity is required to maintain voltage under load.

When compared with 24V DC start units of the same capacity, these units deliver significantly higher performance, resulting in faster spool-ups and cooler starts impacting directly on turbine life.

The units are designed to be carried on board for emergency power or turbine starting and are each fitted with an automatic 3-stage internal charger for maximum cell longevity.

Features

Coolspool 17, 29 and 29 Twin:

- High powered sealed lead acid AGM batteries
- Cleared for air transportation
- Internal charger with LED status indicator
- Corrosion resistant aluminium case with carry handle
- Aircraft cable with heavy-duty Nato connector
- S50 auxiliary/accessory port
- Solid state voltmeter with 'push to view' feature
- Heavy-duty padded jacket

Coolspool 29 and 29 Twin only:

- Controls protected by twin front protection bars
- Spring-loaded output connector cover
- Fitted with rubber anti-slip, shock absorbent feet

Coolspool 17: EC130 preflight and start

Coolspool 29 Twin

Supplied as standard with:

ALL MODELS:


Country-specific input cord(s)


2m Nato plug lead


Padded protective jacket(s)

PLUS, FOR COOLSPOOL 29 TWIN ONLY:


Aviation double trolley


Parallel joining connector

Options

All models: 4m Nato plug lead
Coolspool 29 only: Universal single trolley
Coolspool 29 and 29 Twin only: 24V inspection lamp

Coolspool 29 Twin: in operation with Lynx Wildcat

Specifications

	Coolspool 17	Coolspool 29	Coolspool 29 Twin
Peak amps	1800A	2400A	4800A
Nominal voltage	26V or 28V DC depending on model		
Standing voltage	27.3V or 30.7V DC depending on model	27.8V DC or 30V DC	27.8V DC or 30V DC
Amp/hour capacity	16 Ah @ 10 hr rate (20°C)	26 Ah @ 10 hr rate (20°C)	52 Ah @ 10 hr rate (20°C)
Operating temp	-40°C to +45°C (-40°F to + 113°F)		
Case	Aluminium with lie-flat handle	Aluminium with shock absorbing feet and fixed handle	
Voltmeter	Solid state LED, IP65		
Aircraft cable	2m (6ft) with heavy-duty rubber Nato connector		
Charger	1.9A 3-stage internal charger/90–264V AC/47–63Hz/single phase		2 x 1.9A 3-stage internal charger/90–264V AC/47–63Hz/single phase
Dimensions	H 275mm (10in) L 365mm (14in) W 100mm (4in)	H 345mm (13in) L 405mm (16in) W 135mm (5in)	H 1100mm (43in) (inc. trolley) L 500mm (19in) (inc. trolley) W 560mm (22in) (inc. trolley)
Weight	26V DC version: 17.5kg (38lb) 28V DC version: 18kg (40lb)	26V DC: 28kg (61lb) 28V DC: 29kg (63lb)	70kg (154lb) including trolley
NCAGE	KD628		

DC Power Supplies

PS300: in operation on a Dornier 328

30 TO 300 AMP POWER SUPPLIES: COMPACT – RELIABLE – ESSENTIAL

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.

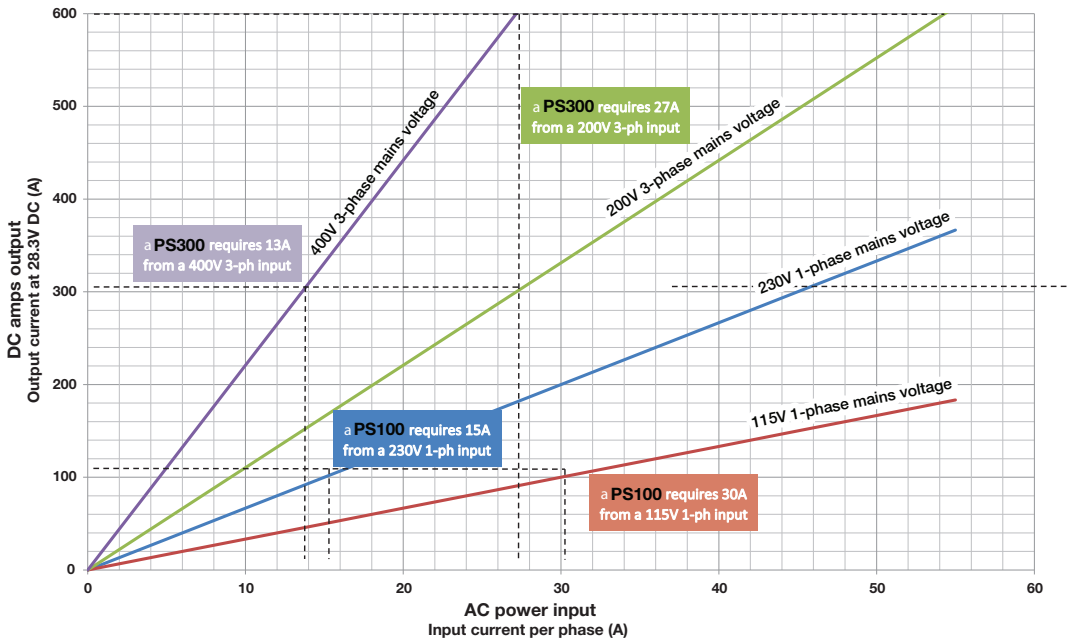
Powervamp's first 28 volt 40 amp power supply was produced in 1995 as a solution to the problem of training police observers on FLIR systems. Until then, training involved expensive helicopter flying hours or powering a FLIR system with battery GPUs with limited power duration.

Powervamp, with its range of power supplies from 30 to 300 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.

Mains power input required to deliver maximum output for the PS100 and PS300 power supply



Power supplies

Power Supply	Output voltage (V)	Maximum current (A)	Input voltage required (V)
PS30M	28	30	110/230 1-ph
PS50M	28	50	110/230 1-ph
PS100	28	100	110/230 1-ph
PS300	28	300	230/400 3-ph

SELECTING THE CORRECT POWER SUPPLY

When deciding on the size of power supply, operators should consider the following:

Aircraft load fluctuation

If aircraft loads are likely to fluctuate, Powervamp strongly recommends a power supply with a digital voltmeter.

Power demand fluctuating close to or above overload will trigger a progressive automatic voltage shutdown which can cause radio static and possible data loss. A digital voltmeter will visually alert the operator to the situation.

All Powervamp power supplies are fitted with accurate digital voltmeters. The larger units are fitted with digital ammeters to give pilots and engineers an instant reading of the load as each system is powered up.

Output limitations

Operators should be aware of possible power output limitations at 110 volts where the mains circuit breaker rating may be insufficient to allow maximum DC output. In this situation, the anticipated output load will need to be checked against the input amperage, which must be less than the circuit breaker rating.

Call for advice

For advice on selecting the correct power supply, call Powervamp's technical support department or appointed distributors, who will be pleased to help you choose the right model for your needs.

+44 (0)1934 643000
info@powervamp.com

Digital voltmeters are included on all Powervamp power supplies

The PS50 is supplied as standard with padded protective jacket and canvas cable bag

PS30M and PS50M

Typical power plant:

Arrius, Rolls-Royce 250, PT6A-27. Continental and Lycoming piston, or power plants of a similar specification

The PS30M and PS50M units are solid state hand-portable combined charger/power supplies delivering a maximum of 30A or 50A at pre-set voltages of 28V DC for avionics use or 31.5V DC for the rapid re-charging of Powervamp's unique 28V DC Coolspool portable aircraft start units. Voltage selection is by front-mounted switch.

Both the PS30M and PS50M can be connected directly to the aircraft's external ground power receptacle or to any of Powervamp's portable battery start unit and are primarily for operators of small to medium helicopters, VLJs and DC business jets to citation size requiring a source of clean stable DC power for software updates. The front-mounted quick-disconnect output connector enables either model to be used as a free-standing portable bench-mounted power supply when used with optional lead sets or alligator clip leads.

The PS30M or PS50, using optional connector sets, can operate in parallel with compatible Powervamp portable start units, delivering continuous power up to their maximum output. Much higher short-term power is then delivered on demand direct from the aircraft start unit.

Automatic input voltage selection 90–264V AC/ 47–63Hz allows international use.

Models supplied as standard with:

Country-specific input cord

2m Nato plug lead

Padded protective jacket(s)

Padded cable bag

Features

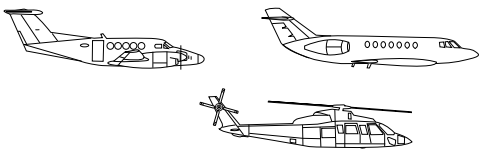
- 28V DC/31.5V DC selectable output
- Mains on/off switch
- Output voltage selector switch
- Output voltage LED status indicators
- Short circuit/current limit protection
- Corrosion resistant aluminium case with carry handle
- Aircraft cable with Nato connector
- Solid state voltmeter
- Fitted with rubber anti-slip, shock absorbent feet
- Heavy-duty padded jacket and cable bag

See p. 26 for technical specifications

PS50M: in operation on a Cessna TTx

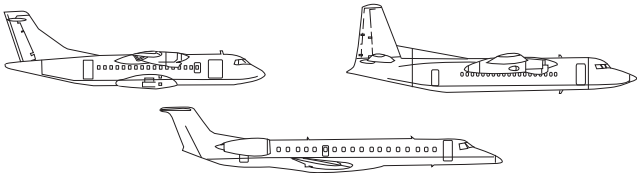
PS100

Typical power plant:*



PS300

Typical power plant:*



Specifications

	PS30	PS50	PS100	PS300
Output voltage	28V DC and 31.5V DC (selectable)		28V DC	28V DC
Output current	30A	50A	100A	300A
Output ripple	<150mV p-p			<200mV p-p
Input voltage	90–264V AC/47–63Hz			(1) 315–457V AC/47–63Hz three phase + neutral + earth (2) 180–264V AC three phase + earth
Input current	6A @ 230V AC, 12A @ 115V AC/single phase (typical)	8A @ 230V AC, 17A @ 115V AC/single phase (typical)	16A @ 230V AC 32A @ 115V AC/single phase (typical)	16A @ 400V AC; 32A @ 200V AC/three phase (typical)
Operating temp	-20°C to +50°C (-2°F to +122°F)			
Case	Aluminium with shock absorbing feet			
Voltmeter	Solid state LED, IP65			
Aircraft cable	2m (6ft) with Nato connector			4m (6ft) with Nato connector
Input cable	-	-	1m (3ft) with 16A 3-pin 6h blue plug	3m (10ft) with 32A 5 pin 6h red plug
Cooling	Forced ventilation			
Protections	Thermal, current overload, short circuit, over voltage			
Dimensions	L 330mm (13in) W 100mm (4in) H 150mm (6in)	L 350mm (14in) W 140mm (5in) H 150mm (6in)	L 435mm (17in) W 135mm (5in) H 340mm (13in)	L 450mm (18in) W 295mm (11in) H 345mm (13in)
Weight	3kg (7lb)	5kg (11lb)	11kg (24lb)	20kg (44lb)
NCAGE	KD628			

2 x PS100 in parallel: delivering up to 200 amps

PS100

The PS100 is a solid state hand-portable power supply delivering a maximum of 100A at a pre-set voltage of 28V DC for avionics use.

The unit can be connected directly to the aircraft's external ground power receptacle and is primarily for operators of large DC business jets requiring a source of clean stable DC power for flight deck power and software updates. The front-mounted quick-disconnect output connector enables this unit to be used as a free-standing portable bench-mounted power supply when used with optional lead sets or alligator clip leads.

Used by civil and military operators, the PS100 is a standard product approved and offered by one of the leading US business jet manufacturers under their part number.

The PS100 is fitted with two 50A power supplies connected in parallel complete with blocking diodes to prevent the highly undesirable reverse battery outrush current that can occur on connection to the aircraft causing arcing at the external aircraft power socket. Power supply healthy LEDs are fitted to the front panel for diagnostics.

Automatic input voltage selection 90–264V AC/47–63Hz allows international use. A solid state voltmeter and ammeter displays the output voltage and current, enabling operators to monitor the current draw of avionics and other pre-flight loads. Supplied with Nato plug lead set, input lead and heavy-duty canvas protective jacket.

Features

- Mains on/off switch
- Power supply LED status indicators
- Short circuit/current limit protection
- Corrosion resistant aluminium case with carry handle
- Controls protected by twin front protection bars
- 4m aircraft cable with heavy-duty rubber Nato connector
- Harsh environment input cable with plug
- Auxiliary socket for plug-in accessories
- Solid state voltmeter
- Solid state ammeter
- Fitted with rubber anti-slip, shock absorbent feet
- Heavy-duty padded jacket

Supplied as standard with:

Hard-wired mains lead

2m Nato plug lead

Padded protective jacket

PS300

The PS300 is a solid state hand-portable power supply delivering a maximum of 300A at a pre-set voltage of 28V DC for avionics use.

The unit can be connected directly to the aircraft's external ground power receptacle and is primarily for regional airline operators of turbine and turboprop DC aircraft or MROs requiring continuous power for maintenance. It has also been used to power large DC aircraft at various air shows.

The PS300 is compact and lightweight and able to power air conditioning on most business jets. It can be placed under the fuselage or wing of small aircraft or helicopters, freeing up hangar floor space.

The PS300 is fitted with three 100A power supplies connected in parallel. Power supply indicating LEDs are fitted to the front panel for diagnostics. When pressed, the emergency stop button immediately disconnects power to the aircraft.

The front-mounted quick-disconnect output connector allows leads of different configurations to be instantly connected to the unit.

Key-switch input voltage selection allows operation at either 180–264V AC three phase or 311–457V AC/47–63Hz three phase for international use.

A solid state voltmeter and ammeter displays the output voltage and current, enabling operators to monitor the current draw of avionics and other pre-flight loads. Supplied with Nato plug lead set, input lead and heavy-duty canvas protective jacket.

Features

- Mains on/off switch
- Power supply LED status indicators
- Short circuit/current limit protection
- Emergency stop push-button
- Corrosion resistant aluminium case with carry handles
- Replaceable/washable air filters allows outdoor use
- Aircraft cable with Nato connector
- Harsh environment input cable with plug
- Solid state voltmeter
- Solid state ammeter
- Fitted with rubber anti-slip, shock absorbent feet
- Heavy-duty padded jacket

Supplied as standard with:

Hard-wired mains lead

4m Nato plug lead

Padded protective jacket

PS300

Portable Fuelling/de-fuelling

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 AC supply can be used with a DC voltage converter.

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, that would otherwise have been discarded, can safely be re-used once passed though the Portapump.

An inlet non-return valve prevents drainback (siphoning) and maintains the back pressure to allow activation of the pressure-operated switch that shuts off the pump motor.

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.

All pipework and fittings are alloy or stainless steel with 'Camloc' quick release fittings to give rapid connect/ disconnect of inlet and outlet hoses.

Features

- Stainless steel tubular frame construction
- Filters to 5 microns solids, and 2 parts per million water
- Three warning LEDs to alert operator of system status
- Reverse polarity alarm
- Fitted with replaceable Facet filter cartridge
- All hoses and pipework supplied with camlock covers or bungs
- Easy servicing – no tools required for filter inspection

Specifications

Suitable only for jet A1 and diesel. Aviation/military standard equipment

Case construction	All-welded stainless steel tubular open space frame
Dimensions mm	H 490 (19in) W 360 (14in) D 330 (13in)
Weight	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 15A pop-out circuit breaker
Filter warning	Indicated by three warning LEDs – Green, Yellow, Red
Static bonding	1000 amp cast brass alligator clip leads 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
Nato stock number	NCAGE: KD628 NSN: 2910-99-297-6913

Supplied as standard with:


3m suction hose


3m delivery hose with nozzle


2-piece aluminium stand pipe


24V input cable


3m earthing cable


Padded protective jacket


Canvas hose and standpipe bag

Options

5m suction hose
5m delivery hose with nozzle
S50 to S175 power cable
S50 to S50 power cable
Flow meter
Powervamp 24V DC GPU or power supply

Services

Installation • commissioning • maintenance

Powervamp's service team operates from its impressive premises at Barton-le-Clay in Bedfordshire, one of the companies two major UK sites (the other being located in Weston-super-Mare).

REPAIRS AND MAINTENANCE

Product support is the core capability of the servicing operation. Skilled engineers can handle repairs and maintenance across the entire range. Products can be returned to the service centre or dealt with on site, as UK-wide travel is part of the company's service proposition.

An increasing number of Powervamp customers take out an ongoing maintenance contract which can cover work on competitors' equipment, as well as Powervamp's own product lines. Activities range from routine battery checks and discharge monitoring to complete swap-outs of faulty materials and components.

To ensure that its service engineers have all the skills needed for any eventuality, Powervamp runs a comprehensive induction and training programme. New recruits are required to spend time on Powervamp's assembly line in order to gain knowledge of product assembly. Staff are also trained extensively in servicing, and repairing, prior to working in the field.

SITE SURVEYS

Powervamp also offers a detailed site surveying service which includes assessing a site's power requirements in order to recommend an appropriate fixed electrical ground power unit. Powervamp is regularly approached to calculate the costs when companies wish to embark on an energy saving scheme, providing more power-efficient equipment

COMMISSIONING

Commissioning is another key function for the servicing team. Ground power unit operators such as major airports sometimes arrange their own installation, but Powervamp engineers still play a vital role, checking that the work has been done correctly – verifying that electrical loads are within stated tolerance or that the installation environment is appropriate. The process can also include the safe disposal of life-expired components with full compliance certification.

TURNKEY INSTALLATION

The team can also offer a complete turnkey installation and commissioning package, either using its own staff or calling on approved specialist contractors with experience and training in Powervamp products.

Call us for more information or to discuss your requirements:
+44 (0)1934 643000
info@powervamp.com

Airshow Services

With a background of more than 16 years in the manufacture and supply of ground power systems for the aviation industry worldwide, Powervamp Ltd has steadily developed its airshow and ground support rental business to become one of the most widely recognised suppliers of this specialised support service. The company is ISO 9001:2002 accredited.

In the early 1990s, Powervamp pioneered the concept of using remote generator power at airshows to operate its unique 28 VDC electrical transformer rectifier units, (TRU's) within the static display area. This removed the problems of ground power units, (GPUs), noise and exhaust pollution, and proved a breakthrough for aircraft exhibitors. The concept swiftly developed into the present practice of using all-electric power for 115v AC 400Hz and DC powered aircraft at static displays.

PROJECT MANAGEMENT

Powervamp's comprehensive airshow support services range from the supply of 28v DC and 115v 400Hz ground power and air coolers to full project management of the static area, including aircraft positioning, cleaning and many other specialist services.

28V DC AND 115V AC GPUs

Powervamp owns most of its equipment, which it renews on a frequent basis. This includes a dedicated stock of its own modern, silent, solid-state 28 VDC power supplies, offering from 25 to 400 amps continuous power, and a large number of 115 volt AC 40 120 kVA frequency converters.

STATIC AREA CABLING

Exhibitors also benefit from Powervamp's own extensive supply of cabling and switch gear (approximately 10 tonnes). All equipment is compatible with one type of 3-phase input voltage for simplicity and ease of operation. Because cabling and switch gear is usually pre-matched at the factory before despatch, hook-up time is saved and clients receive power to their aircraft sooner.

Powervamp can ship this directly from stock to ensure equipment arrives at the exhibition without the need to source ancillary items locally.

AIR CONDITIONING AND SPOT COOLING

Powervamp is highly unusual in owning its own large fleet of air-conditioning units. This allows the company the option to ship by sea freight without the client having to absorb part of the extended rental period of a sea journey or the added premium of airfreight as charged by some organisations, thereby reducing costs to the client.

At major air shows (and other large events) where all or part of Powervamp's spot cooler fleet is already under contract, the company has a reciprocal loan agreement with a major spot cooler supplier thereby ensuring that it always has at its disposal sufficient 1, 3 and 5 tonne units to satisfy its requirements.

CORRECT POWER CALCULATIONS

Knowing the correct Kva static area requirement is critical. Powervamp will calculate your total power needs and can complete any organiser power requirement forms on your behalf. Accurate calculations will minimise your expenditure while ensuring that the risk of a major problem on show opening day caused by under-specifying the power and the tripping of circuit breakers is eliminated.

Back-up equipment is always shipped to the venue and is held on site for immediate 'swap-out' in case a failure occurs. However, because Powervamp designs, manufactures, owns and operates most of its equipment, its on-site team is usually able to quickly diagnose and fix the problem in less time than it takes to deliver and connect a replacement unit.

Call us for more information or to discuss your requirements:
+44 (0)1934 643000
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See Powervamp's team in action at the Paris Airshow on our YouTube channel

Powervamp
ADVANCED POWER SOLUTIONS

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