

PV45

45kVA 400Hz MOBILE ELECTRICAL GROUND POWER UNIT

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 ground power unit is targeted at the 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.



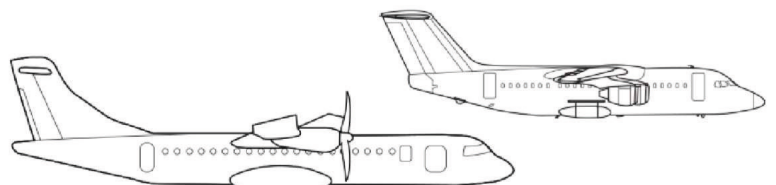
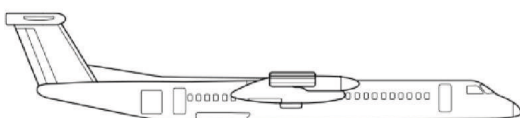
Features

- Compact
- 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 lead (specify length at time of order)
- Pre-fitted output lead with aircraft connector (specify length at time of order)

Supplied as standard with



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



Specifications

Output active power (kW)	36.0
Apparent output power (kVA)	45.0

INPUT

Number of phases	3
Nominal input voltage	200V/240V/400V/480V 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/125A (depending on voltage input selection)

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

OVERLOAD

45kVA @ 0.8PF Continuous
125% for 5 minutes
200% for 5 seconds
250% for 1 second

EFFICIENCY

100% load	> 91%
50% load	> 82%
Standby losses	< 60W
No load losses	12 < 2kW

GENERAL

Operating temperature	-40°C to +50°C
Altitude	2000m before de-rating
Protection level	IP55
Colour	RAL 9016
Noise Level	< 65dBA @ 1m

Dimensions

Dimensions mm		
Fixed:	H 957mm (38in)	W 604mm (24in) D 914mm (36in)
Mobile:	H 1096mm (43in)	W 604mm (24in) D 914mm (36in)
Weight	460kg (1014lbs)	

Standards

Safety	EN 62040-1
Emissions	EN 61000-6-3
Immunity	EN 61000-6-2
Specification for 400Hz 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: powering Bombardier CRJ1000

Operation

Input Isolator Switch

Fitted with terminal shrouds and mechanical door interlock, this ensures maximum user safety as the door cannot be opened until the switch is in the off position. Once this switch is in the on position, the system is in standby ready for use, no complicated start sequence required!

Rectifier

The rectifier supplies low ripple DC to the inverter section using rugged 12-pulse technology, the rectifier offers near unity input power factor (>0.97) with low harmonic content.

Near Unity Power Factor = Lower input current

Low Harmonic Content = Less strain on the electrical infrastructure.

Inverter

The inverter converts the DC supplied from the rectifier into high quality 400Hz AC using the latest PWM technology, the PV45 inverter is highly efficient whilst providing a clean output (< 2% THD) suitable for all aircraft.

Output Transformer

Using high grade steel ensures a compact, lightweight and efficient transformer which acts as a filter and also provides the required galvanic isolation.

Output Contactor

Complete with interlock, the output contactor ensures power is isolated from the plug until the aircraft is ready to accept power.

Standard features

High Overload Capability

Modern aircraft demand high overload capability; the PV45 offers compatibility with all modern aircraft.

Auto Connect

After ground support press the on button, the system will run for up to 10 minutes, if during this time the pilot requests ground power, power is automatically connected without any further intervention from ground support.

Automatic Line-drop Compensation

The automatic line-drop compensation ensures each phase is individually adjusted to achieve the correct voltage at the aircraft plug. The compensation can be adjusted easily via the user interface panel (when in service mode).

Remote Control/Monitoring Connectors

Remote on /off/monitoring allows the system to be controlled and monitored from a distance either from the aircraft plug or via remote switches at the end of a cable carrier system.

Safety features

Neutral Monitoring

The aircraft is referenced to earth via the neutral conductor, this means it's critical that the neutral conductor is not disconnected as this can cause the aircraft body to rise up to an unsafe potential. The PV45-1 monitors the neutral conductor via the interlock cable and disconnects the output in the event of neutral cable failure.

Emergency Stop

An emergency stop button is fitted as standard, when pressed, the output will rapidly disconnect and the system will shut down in a controlled manner.

Aircraft Interlock

Selectable via the control panel, the interlock can be setup for either civil or military interlock types. The interlock ensures output power is not energised unless the plug is connected to the aircraft and the interlock signal is received.

Rear Door Interlock

Ensures the rear door cannot be opened without isolating the input power.

Enclosure

Double Door Seals

Dual seals on all doors for improved ingress protection.

Rust Treatment

The enclosure is pre-treated with a rust inhibitor to extend the life of the enclosure.

Paint Finish

Powder Coat paint finish suitable for outdoor use. Standard colour is RAL9016, other colours available.

Mobile

Heavy duty castors fitted as standard making the PV45 easy to manoeuvre around the hangar. Brakes fitted to the front swivel castors for added safety.

Control Panel

LCD Screen

A large blue-backlit LCD screen provides detailed information of the supply and output parameters. Intelligent system status updates are also displayed providing the user with live system and interlock information.

Status Indication

High Intensity LED status indicators provide instant status overview:

GREEN: System Healthy

AMBER: System in Alarm

RED: System Fault

Menu Function

Simple menu navigation allows easy access to additional features and settings.

Easy Robust Operation

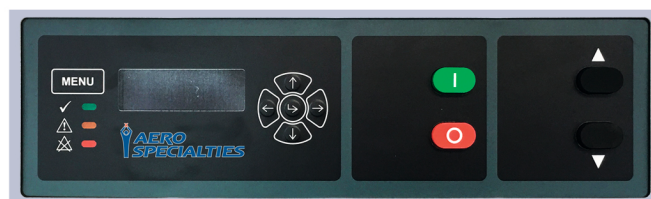
Large rubber ON/OFF buttons offer easy robust control of the system in all weather conditions.

Secret-till-lit Technology

The PV45 offers unique secret-till-lit technology simplifying user operation and allowing the same control panel to be used for various applications. The illustration below shows the combinations available.

Data-logger

Real time data logging of system operations as well as alarm data. Each entry is date stamped for accurate diagnosis. Output power consumption is also logged at 5 minute intervals.



Optional features

- Monitoring and Billing System (MABS™)
- Fixed Mounting: In place of the standard mobile configuration, the system can be supplied with a plinth for fixed installations
- External Card Swipe Input: Requires remote contact closure before allowing the system to operate
- Hard-wired power input cable
- 400Hz 6-pin output cable and connector

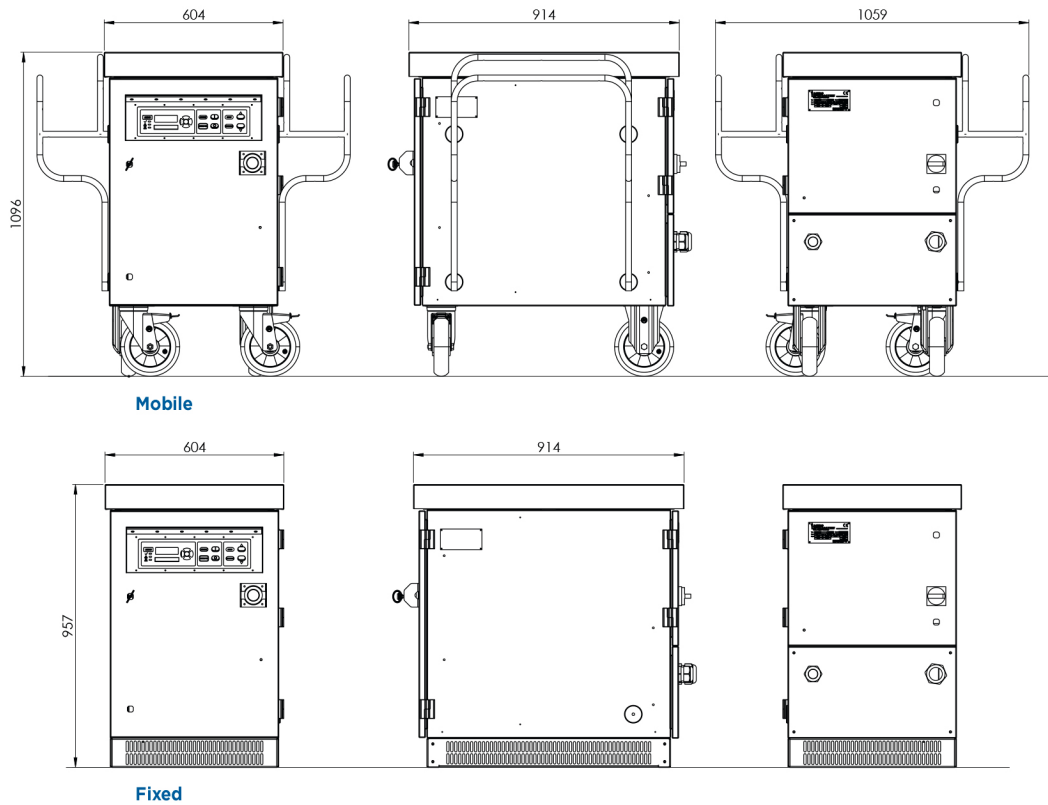
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Protections

The PV45 is packed with electronic protections to ensure that the system protects the user/aircraft and system during abnormal conditions.

- No Break Power Transfer (NBPT)
- Output Neutral Monitoring
- Output Overload
- Output Short Circuit
- Output Under/Overvoltage
- Output Current Limit
- Over Temperature
- Aircraft Interlock
- Input Supply Monitor (voltage & frequency)
- Input Phase Rotation

PV45 configuration options



Other 400Hz GPUs in the AERO Specialties range



PV90-4