

Piller UB-V Series

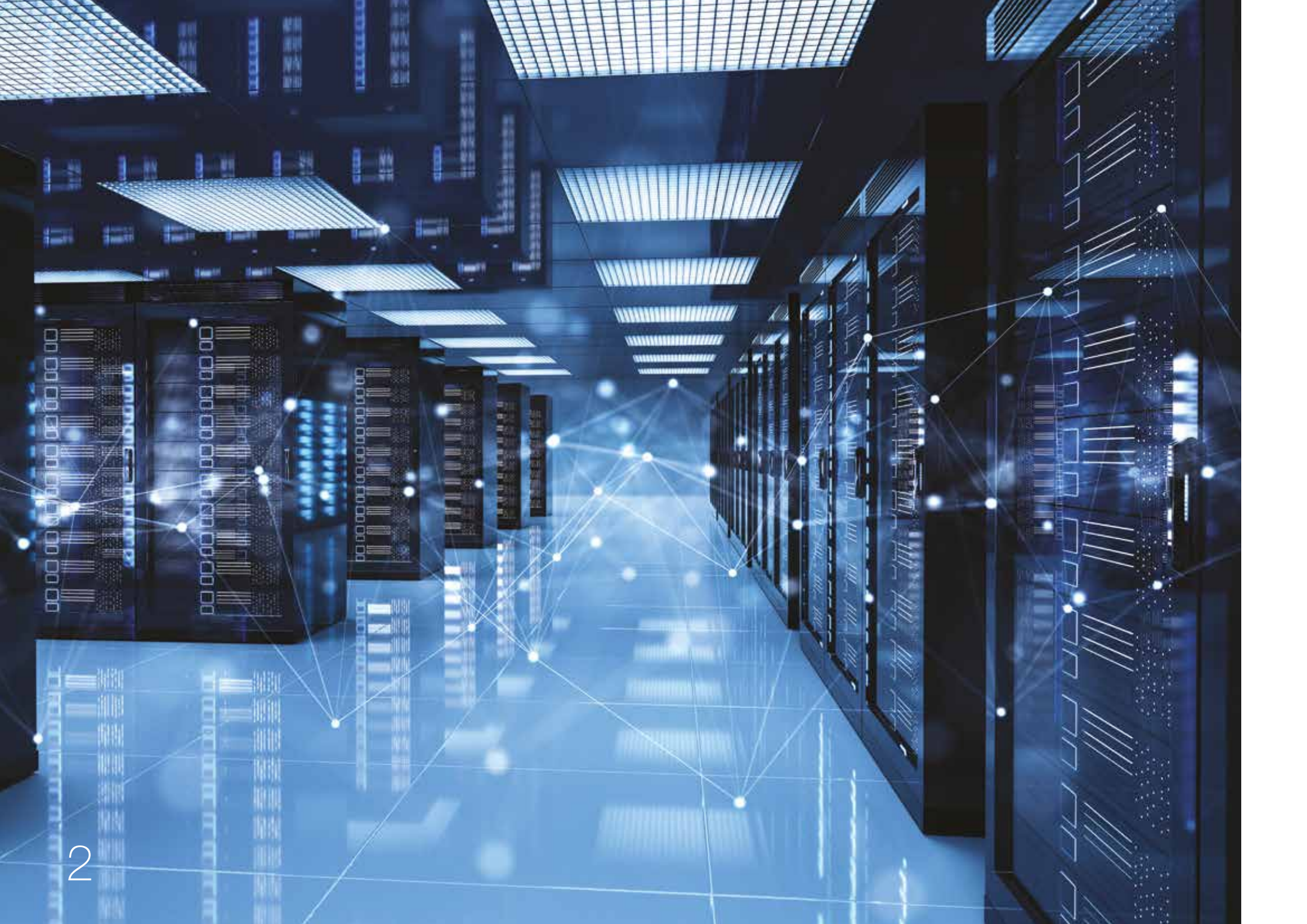
HIGH PERFORMANCE UPS FOR DATA CENTRES



PILLER
Power Systems

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piller.com



UB-V series high performance UPS for all large scale data centres



Introducing Piller's new high-performance UB-V ELECTRICALLY COUPLED UPS series for the conditioned power protection needs of cloud hyperscale, wholesale colocation and large enterprise deployments.

The Piller UNIBLOCK™ UB-V is a flexible solution providing up to 3.24MW of UPS in a single module to give higher reliability compared with large scale static deployments and better availability through significantly extended preventative maintenance service intervals leading to fewer shutdowns.

What Makes the UB-V Series Different?

- UB-V provides on-line efficiency of up to 98% at 100% load and 97% at 50% load when compared with static UPS which typically operate around 96.3% efficiency at both 50% and 100% loads.
- The UB-V UPS has no power capacitors or electric fans. The mean-time between failure of a single unit rises by a factor of 5 times when compared to failure rates of a typical static UPS.
- Piller UB-V UPS features a new control platform incorporating self-diagnostics for predictive maintenance and continual peace of mind. Piller's **e-VENTLOG™** is a new service package with remote monitoring which can make annual service shutdowns a thing of the past. In controlled environments **e-VENTLOG™** can completely eliminate the need for operational shutdown of the UPS for up to five years.

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Single UB-V UPS modules deliver up to 3.24MW for power at scale



New HMI functionality.

Providing power stability at scale

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UB-V electrically coupled UPS works well with renewable and sustainable energy sources for bi-directional power flow feeding energy back to the grid

ELECTRICALLY COUPLED UB-V SERIES UPS BENEFITS

- The UB-V series unit's power ratings range from 1100kVA 1.0MW to 3600kVA 3.24MW in both battery and kinetic energy storage versions, making them ideal for large scale deployment.
- To minimise the need for human intervention, allow monitoring and even manage data centres remotely, the UB-V series offers a unique service regime which means that units can be condition-monitored remotely and can have off-line service intervals as little as once every five years.
- Extended service intervals are made possible through the UB-V's much higher reliability, typically achieving up to 5 times more than its nearest rivals of conventional static UPS. This is achieved by using fewer components and eliminating component wear parts such as power capacitors.
- Operating efficiency is a key financial driver for the modern data centre. On-line mode UB-V efficiency is typically higher than that for conventional static UPS across most of the load operating range – thereby reducing energy costs without compromising protection.
- Piller UB-V solutions are also designed for integration with renewable and sustainable energy sources, having bi-directional power flow for feeding energy back to the grid or transferring from one energy source to another within a micro-grid.
- Piller's UB-V units removes the need for multiple module paralleling to achieve higher power ratings. Less paralleling can also provide better reliability and higher availability in the power string of large data centres.
- UB-V systems can save on space and capital infrastructure cost. They can operate at low or medium voltage levels to give greater flexibility in scheme design as data centres continue to grow.

Electrically Coupled UPS

Most data centres are powered by electrically coupled UPS. An electrically coupled UPS connects the energy store with the UPS unit using only an electrical connection. Power semi-conductors are used to control the energy flow for both discharging and recharging. The UPS performance, overhaul and maintenance requirements are largely determined by the method through which energy is transferred in and out of the energy store. Electrically coupled UPS include conventional static and UB-V technology.

Piller's high performance UB-V UPS is a new generation electrically coupled UPS. It is designed for flexibility, availability and reliability while providing capital cost control and maximised operating efficiency. As hyperscale cloud companies, large colocation investments and enterprise demands drive growth in the global data centre market, the use of electrically coupled UPS systems continues to grow.

Cloud, Colo and Enterprise



For wholesale colocation companies who build and operate data centres at scale to service high end business critical workloads for multiple commercial and enterprise customers, reliability and uptime are paramount. The same is true for hyper-scale firms offering cloud platform infrastructure and business applications at the highest scale.

At every level colocation managers and their cloud peers must be highly responsive to customer needs for flexible power and varying power densities. They must ensure maximum operational efficiency and highest possible availability at all times. Moreover, the provision of dedicated space, power and cooling at scale also demands widespread,

redundant power which is both stable and flexible. Piller's UB-V electrically coupled UPS power infrastructure is specifically designed to meet all these supplier and customer needs.

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As IT strings approach 2MW and above UB-V cost per kW is better than that of static UPS systems

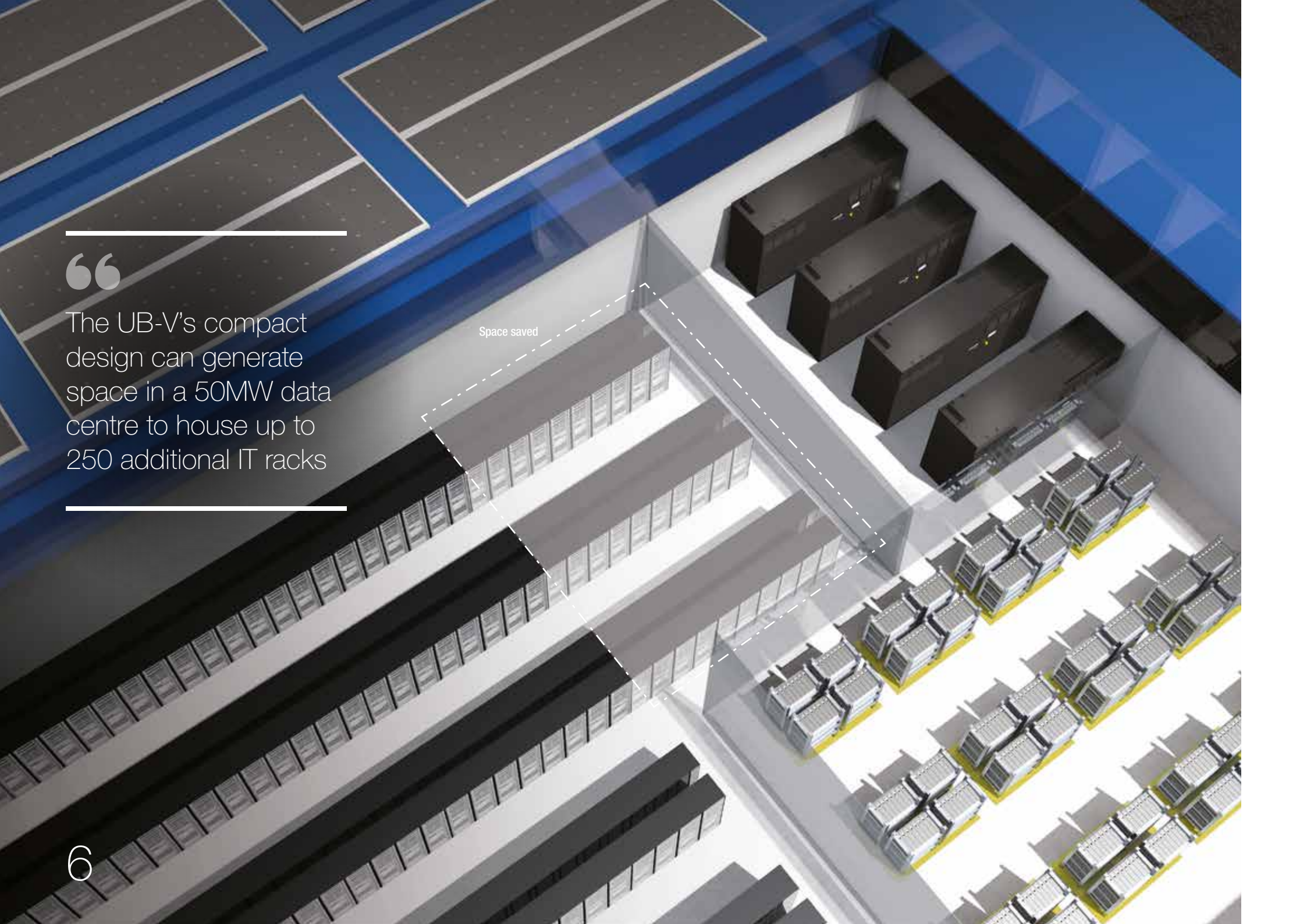


Piller's UB-V UPS ensures the highest possible availability without compromise.

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The UB-V's compact design can generate space in a 50MW data centre to house up to 250 additional IT racks

Space saved



Capital efficiency of UB-V series UPS

Hyperscale companies are driven by the quest for ever greater efficiency in every area. Build-out growth rates of next generation data centres make it vital to optimise capital investment from day one of operation.

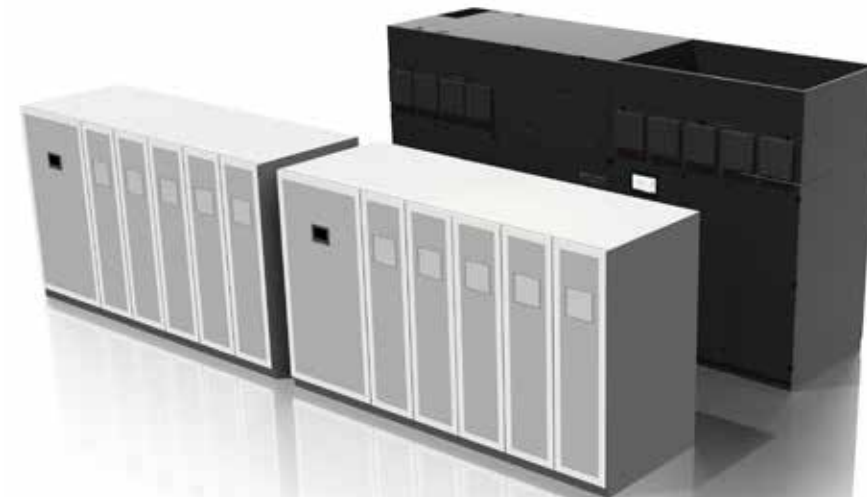
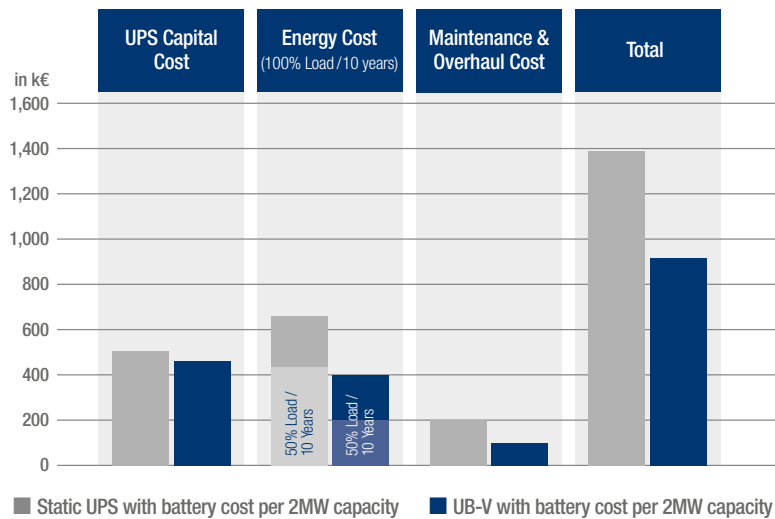
As enterprises increasingly shift workloads to the cloud and as cloud-based digitally native firms expand, fierce competition among cloud providers further increases the need for cost control and capital efficiency.

Piller UB-V series has been designed with reduced infrastructure capital costs firmly in mind. The more its power rating rises, the more favourable the capital costs per kW become. With a relatively small physical footprint compared to typical static systems, the UB-V UPS can save more than 20% of data centre plant room space, thereby freeing up real estate for revenue-generating activity.

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Build-out growth rates of new generation data centres make it vital to optimise capital investment from day one

TCO Comparison 2MW Static vs 2MW UB-V



UB-V offers significant space savings compared to other UPS.

Operational efficiency

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A 48MW data centre equipped with UB-V UPS can save up to \$7.5 million in electricity costs over ten years

In efficiency terms, the UB-V UPS with a battery power source compares favourably with static UPS. UB-V, provides on-line efficiency of up to 98% at 100% load and 97% at 50% load, against static UPS which typically operate around 96.3% efficiency at both 50% and 100% loads.

Like-for-like comparisons between UB-V electrically coupled UPS and mainstream static UPS solutions in on-line mode show the UB-V provides greater efficiency across much of the operating load range, especially at higher UPS ratings.

At multi-MW scale, this can represent vast sums saved in operational costs with, for example, a 48MW data centre saving up to \$7.5 million in electricity costs over ten years (based on \$0.1kWh energy cost).

Piller e-VENTLOG™

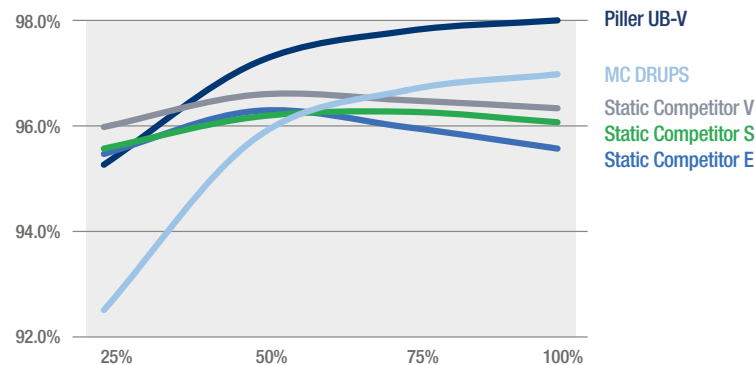
Standard servicing for the UB-V is already much reduced compared to many mechanically coupled and static UPS. However, the UB-V performance can be further enhanced with the addition of a new innovative communication solution that monitors

multiple operating and predictive maintenance parameters and can send system data directly to an operation centre.

Available in conjunction with any Piller UB-V UPS and Unity Service Pack, **e-VENTLOG™** is a maintenance service that provides shutdown-free annual maintenance checks, eliminating the need for physical intervention inside the UPS.

Whereas physical checks can result in a UPS being off-line for several hours per year, with **e-VENTLOG™** in place this downtime is completely eliminated. The service can be implemented in any suitable environment and the data gathered either automatically across the internet in a secure manner or by direct download at the machine itself.

Efficiency of different UPS types



Efficiency comparison of battery-backed electrically coupled UPS types and mechanically coupled UPS in on-line mode.



UB-V benefits over static UPS

Because the UB-V UPS series has been designed without power capacitors or electric fans and has no internal paralleling of power strings, the mean time between failure of a single unit rises by a factor of 5 (hundreds of thousands of hours to millions) when compared with the failure rates of a typical static UPS.

Static UPS use for large scale data centres means paralleling many low power modules. With the UB-V UPS series the smallest unit delivers 1.0MW and a single unit can provide 3.24MW of conditioned power.

UB-V higher reliability reduces, and in some cases eliminates, the need for physical interventions in the servicing of UB-V electrically coupled UPS compared with strict annual or even twice-yearly servicing regimes required by some UPS systems.

The UB-V UPS series can easily be employed at either low or medium voltage and can be utilised with upstream or downstream standby generators.

For long term sustainability UB-V technology has been specifically designed to work well with renewable/alternative energy sources. It provides both stabilisation and bi-directional power flow for feeding energy back to the utility.



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UB-V series UPS
operates for years
with minimal on-site
maintenance visits

Piller business and technology pedigree

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Global coverage
with over 300 service
personnel across
24 countries

Piller was founded in Hamburg, Germany in 1909 by engineer Anton Piller.

Employing around 1000 people worldwide, Piller is headquartered in Osterode, near Hanover, Germany, with subsidiaries across Europe, America, Asia and Australia.

Piller occupies a unique position, being the only company to produce both types of electrically coupled UPS technologies and with kinetic energy storage or battery options. The company also manufactures aircraft ground power units, 50/60Hz frequency converters, static transfer switches and specialist marine generators. With more than 7000 kinetic energy storage devices and over 6000 high power UPS units installed, Piller has more than 300 service personnel taking care of clients across 24 countries.

The Piller group is a wholly owned subsidiary of the multi-disciplined global UK engineering and industrial group, Langley Holdings Plc. In 2016, Piller acquired Active Power Inc., the flywheel energy storage specialist.



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AI, IoT and Edge will generate hundreds of Zettabytes of data annually – thousands of MW of stable power in cloud, commercial and enterprise data centres is needed for the data volume explosion



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ELECTRICALLY COUPLED UPS

CONTAINERISED UPS

STABILISERS

STATIC TRANSFER SWITCHES

KINETIC ENERGY STORAGE

AIRCRAFT GROUND POWER SYSTEMS

FREQUENCY CONVERTERS

NAVAL POWER SUPPLIES

SYSTEM INTEGRATION

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Power Systems

The new UNIBLOCK™ UB-V series UPS platform is designed for the typical large scale data centre and combines cost effective ownership with high reliability, efficiency and power density.

The UB-V Series UPS is Piller's latest generation of electrically coupled UPS. A completely new electronics platform affords even higher Reliability through advanced self-diagnostics and a revised internal architecture employing a unique real-time Ethernet communication protocol known as PillerLINK™. A patented ring topology provides redundancy between electronic boards powered by redundant power supplies that are fed from redundant sources.

The self-diagnostics allow the UB-V to monitor multiple operating and predictive maintenance parameters in real time. Using such resources, the units can reliably operate in certain installations without the need for any annual maintenance shutdown. This, combined with a five-year inspection and a very high operating Reliability, dramatically pushes up the UPS Availability and cuts the cost of ownership during the life of the unit.

With UPS ratings ranging up to 3600kVA / 3240kW, the UB-V Series offers continuous on-line efficiencies as high as 98% at full load and typically at least 97% at half load making it less costly to run than many of its contemporary rivals.

In all, the UB-V Series UPS for use in large scale data centres, improves Availability, operating costs and Reliability at the same time as reducing footprint and capital cost per kW. Its technology is based upon proven techniques developed over several decades and used to protect many of the World's leading Banks and similar pre-eminent mission critical facilities.

UB-V SERIES UPS BENEFITS

- Up to 98% efficiency at full load, 97% at half load (IEC 62040-3)
- No routine annual maintenance shutdown
- Low and Medium voltage versions
- Lithium ion, VRLA or flywheel ride-through
- Suitable for export of embedded power
- Suitable for stabilisation of renewable energy sources
- Competitive footprint, saving 20% floor space
- Extended power range – single units up to 3240kW
- Advanced control system with self-diagnostics



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UB-V BATTERY

Type	Power Rating		Voltage / Frequency		W (mm)	Dimensions D (mm)	H* (mm)	Weight kg	Energy storage Type
	kVA	kW	V	Hz					
UB-V 1200	1300	1200	480V / 60Hz		4600	1320	2700	12190	Battery
UB-V 2000	2200	2000	480V / 60Hz		4800	1320	2700	14750	Battery
UB-V 3240	3600	3240	480V / 60Hz		8400	1470	2700	24200	Battery

UB-V POWERBRIDGE™

Type	Power Rating		Voltage / Frequency		W (mm)	Dimensions D (mm)	H* (mm)	Weight kg	Energy storage Type
	kVA	kW	V	Hz					
UB-V 1200	1300	1200	480V / 60Hz		5300	1320	2700	18300	PB21
UB-V 1200	1300	1200	480V / 60Hz		6395	1672	2700	24820	PB60+
UB-V 1800	2000	1800	480V / 60Hz		5300	1320	2700	20370	PB21
UB-V 1800	2000	1800	480V / 60Hz		6395	1672	2700	26870	PB60+
UB-V 2150	2400	2150	480V / 60Hz		5800	1320	2700	22040	PB21
UB-V 2150	2400	2150	480V / 60Hz		7695	1672	2700	29230	PB60+
UB-V 2700	3000	2700	480V / 60Hz		7695	1672	2700	30430	PB60+
UB-V 3240	3600	3240	480V / 60Hz		9095	1672	2700	35810	PB60+
UB-V 1800	2000	1800	600V / 60Hz		5500	1320	2700	20600	PB21
UB-V 1800	2000	1800	600V / 60Hz		6595	1672	2700	27020	PB60+
UB-V 2150	2400	2150	600V / 60Hz		6300	1320	2700	22550	PB21
UB-V 2150	2400	2150	600V / 60Hz		7395	1672	2700	15620	PB60+
UB-V 2700	3000	2700	600V / 60Hz		7695	1672	2700	30430	PB60+

UB-V SERIES AT MEDIUM VOLTAGE

Type	Power Rating		Voltage / Frequency		W (mm)	Dimensions D (mm)	H* (mm)	Weight kg	Energy storage Type
	kVA	kW	V	Hz					
UB-V 1800	2000	1800	MV / 60Hz		4300	1320	2700	17810	PB21
UB-V 1800	2000	1800	MV / 60Hz		5395	1672	2700	25440	PB60+
UB-V 2000	2200	2000	MV / 60Hz		3600	1320	2700	11650	Battery
UB-V 2150	2400	2150	MV / 60Hz		4300	1320	2700	18860	PB21
UB-V 2150	2400	2150	MV / 60Hz		5395	1672	2700	25440	PB60+
UB-V 2700	3000	2700	MV / 60Hz		6495	1672	2700	26620	PB60+

* Including 400mm silencer – removable for transport.

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