

Piller UB-V Series

HIGH PERFORMANCE UPS FOR DATA CENTERS

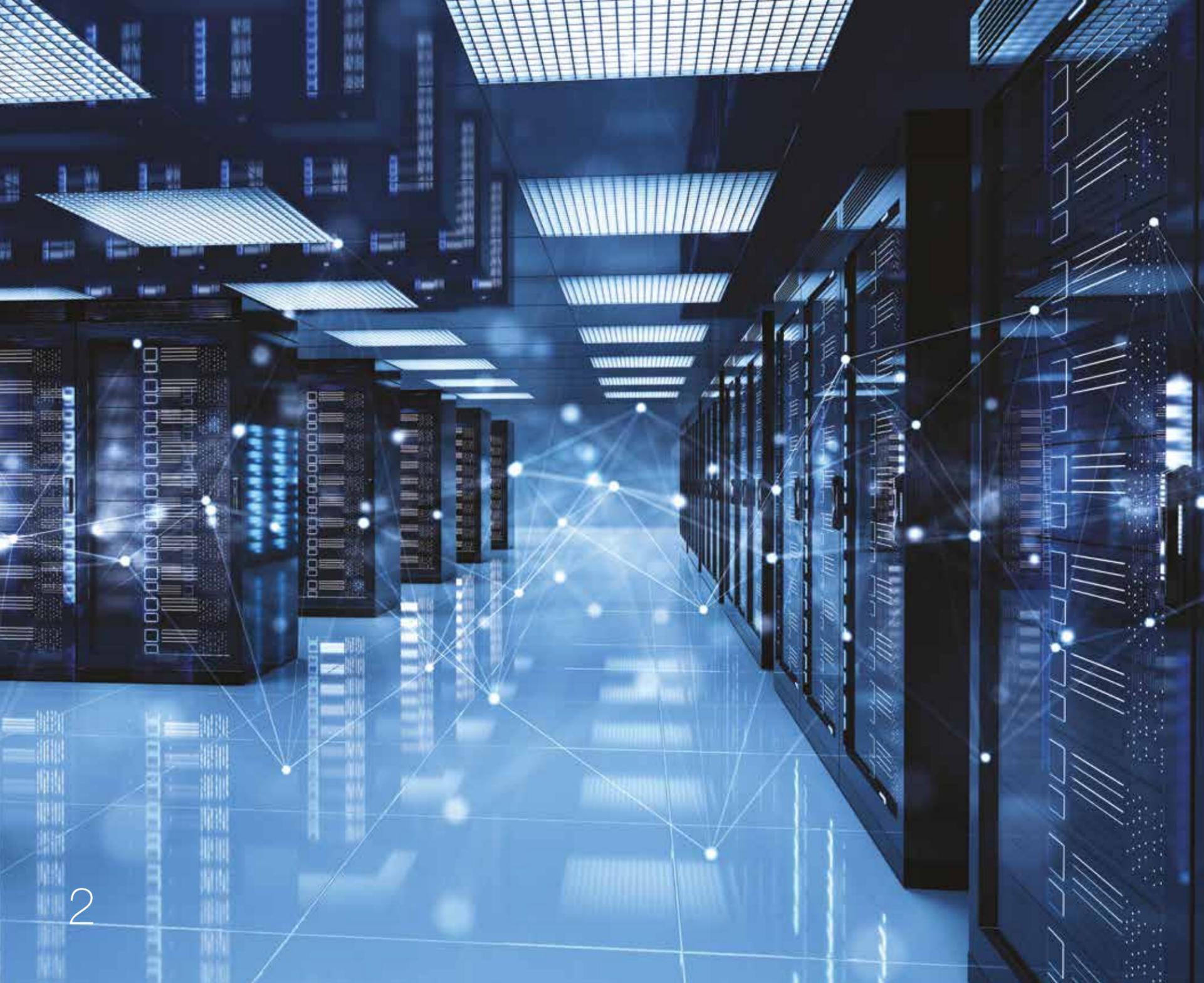


PILLER

Power Systems

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

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

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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 centers 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 center. 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 centers continue to grow.

Electrically Coupled UPS

Most data centers 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 maximized operating efficiency. As hyperscale cloud companies, large colocation investments and enterprise demands drive growth in the global data center market, the use of electrically coupled UPS systems continues to grow.

Cloud, Colo and Enterprise

For wholesale colocation companies who build and operate data centers 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

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

Capital efficiency of UB-V series UPS

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

Space saved

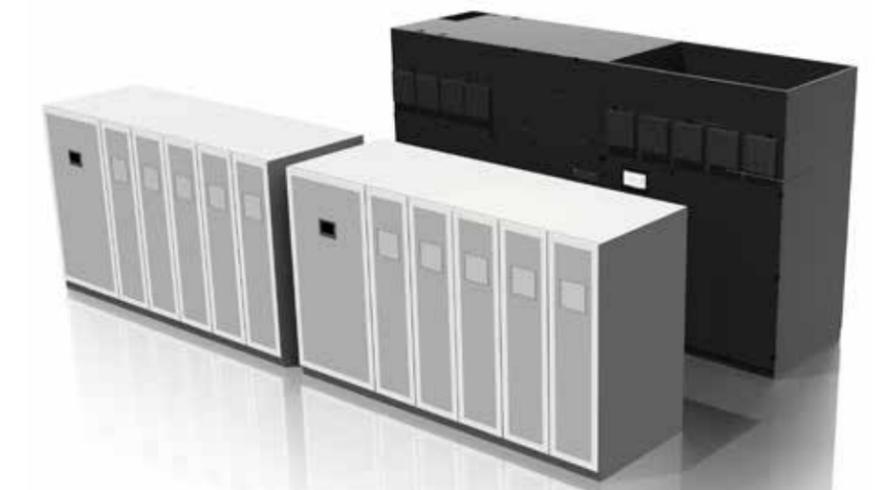
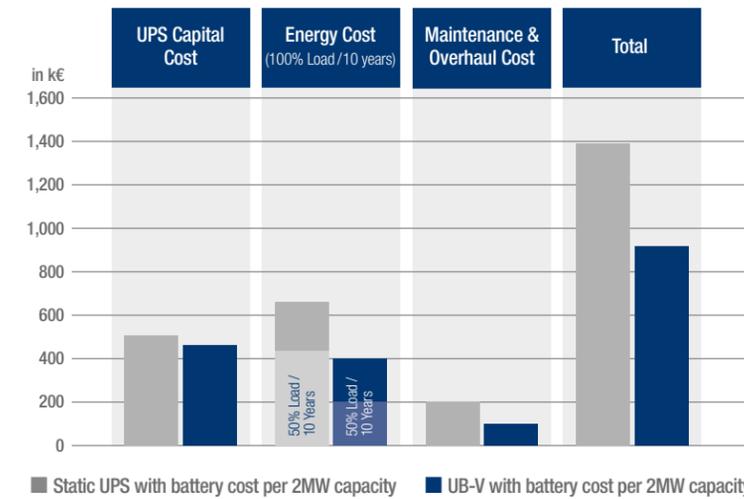
Hyperscale companies are driven by the quest for ever greater efficiency in every area. Build-out growth rates of next generation data centers make it vital to optimize capital investment from day one of operation.

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 favorable 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 center plant room space, thereby freeing up real estate for revenue-generating activity.

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Build-out growth rates of new generation data centers make it vital to optimize 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 center 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 favorably 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 center 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

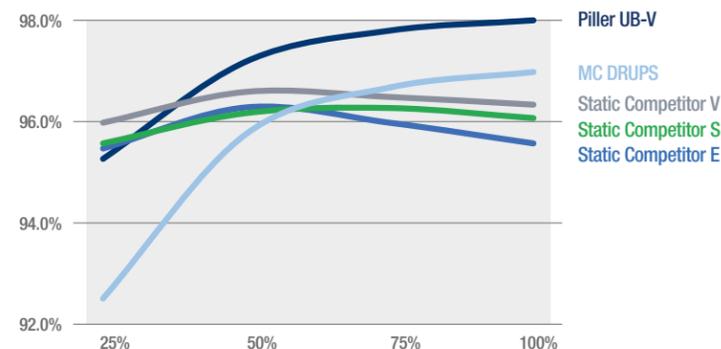
solution that monitors multiple operating and predictive maintenance parameters and can send system data directly to an operation center.

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 centers 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 utilized 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 stabilization 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 centers is needed for the data volume explosion



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ELECTRICALLY COUPLED UPS

CONTAINERIZED UPS

STABILIZERS

STATIC TRANSFER SWITCHES

KINETIC ENERGY STORAGE

AIRCRAFT GROUND POWER SYSTEMS

FREQUENCY CONVERTERS

NAVAL POWER SUPPLIES

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