UNIBLOCK™ UBR

Hybrid Rotary UPS

From 150kVA – 40MVA

PILLER

Power Systems

Nothing protects quite like Piller

piller.com

UNIBLOCK™ UBR


Piller headquarters, Osterode, Germany.

About Piller

Founded in Hamburg, Germany over 100 years ago by Anton Piller, the company has a long history in the manufacturing of exceptionally high quality electrical machines and power quality equipment. Today, Piller is a world leader and innovator in a number of power protection technologies, specialising in UPS systems for 'mission critical' applications and Frequency Converters for Aircraft Ground Power amongst other uses. For the past 30 years, the company has designed and manufactured static technology products alongside their rotary counterparts, giving it a unique position in today's power protection market.

Piller UPS systems are found in applications where continuous high quality power is paramount such as computer data centres, financial institutions, broadcasting, telecommunication networks, airports, healthcare facilities and continuous process production sites.

Piller Frequency Converters and related products are widespread in both military and civil applications providing 400Hz ground power systems to airports, ship-to-shore supplies in ports and on-board power systems for both submarine and surface vessels.

Since 1919, Osterode in Germany has been the home of Piller Research, Development and Manufacturing and a source of pride where all products can be seen in manufacture, from raw material through to finished goods. In 2016 Piller Power Systems Inc., the US subsidiary of Piller Group GmbH, acquired the business and assets of Active Power Inc., a US kinetic energy storage specialist. Piller Group GmbH is a division of the UK based engineering and industrial group, Langley Holdings PLC. (www.langleyholdings.com).

The Problem

The internet and telecommunication revolution has transformed the way we do business, process data and communicate across the globe. As we become increasingly dependent upon information technology, minimising system failures is absolutely critical.

Nearly every days main failures occur lasting longer than 10 milliseconds. This endangers the operation of many data centres and industrial processes and in most cases is directly attributable to an interrupted or poor quality power supply.

Informed business leaders understand the need to minimise risk to their systems and place power supply protection at the centre of their risk management strategy.

Many businesses are unaware of the very real threat posed by numerous and unexpected mains electrical supply disturbances and the resultant risk of data or production loss. Data recovery or re-starting production can be extremely time-consuming at best and at worst impossible. An independent research organisation undertook a study that identified the actual cost of data centre failure as having increased by 40% over recent years.

Piller Protects:

- Airports and Naval
- Banking and Finance
- Data Hosting and IT
- Communications and Broadcasting
- Continuous Process Manufacturing
- Healthcare

Power without compromise

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The Solution

A Piller Uninterruptible Power Supply System (UPS) provides the essential cover and peace of mind, to ensure mains disturbances don't have a major impact on a business. As the world's leading manufacturer of large scale UPS solutions, Piller has thousands of systems installed around the globe, providing major industries with the power protection they need.

The IT sector is changing rapidly and today's UPS technologies must have the capability to meet the needs of tomorrow. In recent years the design requirements of UPS power for data centres has grown and now demands the highest possible levels of reliability combined with significantly reduced levels of maintenance and intervention. These additional demands are readily met by Piller's unique rotary technology.

The Uptime Institute sets out requirements for the design of data centres, laying down standards of increasing levels of quality. As these standards increase, fewer and fewer solutions are capable of supporting the higher levels. At the highest level entire redundant UPS systems are recommended to support single loads and this creates new technical challenges not met by most mass produced solutions.

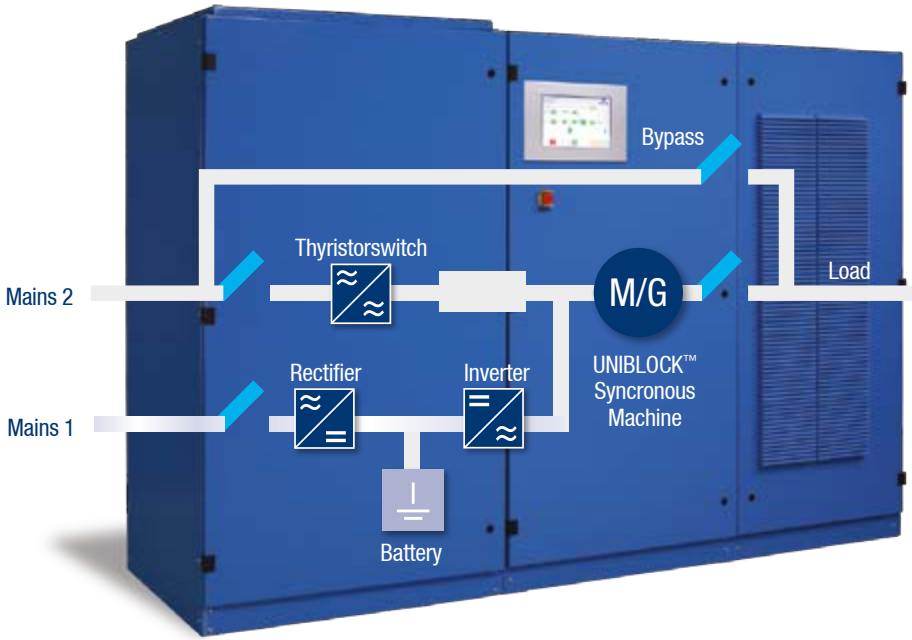
Further, the Uptime Institute states that there is a requirement for the best data centres to be protected to industry Tier 4 standards. The Piller UNIBLOCK™ UBR has the versatility and capability to meet these demands through its robust and proven operating characteristics.

With many years' international experience in providing high-performance power protection systems, Piller's UNIBLOCK™ UBR technology is based on superior expertise. Its unique concept combines high performance motor generator construction with straightforward power bridging, controlled by the latest processor technology.

This approach to UPS design has repeatedly proven to be the best choice when compromise is not an option.

UNIBLOCK™ UBR features

- Full galvanic isolation for independently earthed systems
- Internal redundancy for optimum reliability
- Unique dual diversified input capability
- Voltage and frequency control for synchronised systems
- Adaptability for changes in load demands such as leading power factor



Innovation for your benefit

The Piller UNIBLOCK™ combines a motor and a generator in a single, three-phase synchronous unit. During construction, the windings of both components are incorporated in a shared stator and are excited by a common rotor. The energy transfer from the motor to the generator takes place via direct magnetic coupling without loss and without electro-mechanical conversion, in turn providing electrical (galvanic) isolation between the mains supply and the load.

This approach to construction offers several advantages including a high load-carrying capacity. In addition it is robust, highly efficient, can be loaded continuously and also overloaded simultaneously. The latter being impossible with the power electronics found in most static UPS systems.

The UNIBLOCK™ also prevents load disturbances from reaching the mains. It has a damper cage that absorbs current harmonics, irrespective of load current and load power factor. Unbalanced loads are also equalised.

By combining the UNIBLOCK™ with the UBR configuration, a truly unique concept can be achieved – a natural sine wave, utilising the flexibility of power electronics but still maintaining an extremely high degree of reliability.

Feature	Benefit
Very high reliability	Higher availability and reduced risk to your loads.
High inherent fault clearing capacity	Rapid disconnection of faulty loads is possible even in battery operation. No by-pass supply needs to be present, which is necessary for static systems and reduces the risk of outages to critical load.
Higher efficiency	Reduces operating costs and minimises the total cost of ownership of the UPS system.
No power capacitors or electric fans	Reduces maintenance costs and more importantly removes the risk of unplanned failure of these components.
Full galvanic isolation	Independent earthing systems are easily implemented avoiding circulating currents and erratic discrimination without the need for additional isolation transformers – this reduces system complexity, improves efficiency and gives cost and space savings.
Near unity input power factor	Power factor protection is not required saving capital and maintenance costs.
No crest factor limit	Capable of delivering high peak currents for harmonic loads.
Water cooled option	Direct coupled cooling eliminates the need for air-conditioning, saving space, cost and removing the need for additional maintenance overheads.
Full voltage and frequency control	UBR is the only UPS to offer rotary characteristics combined with double conversion allowing synchronization for Tier 3 and Tier 4 requirements.
Redundant power conditioning paths	The UPS can be fed from different sources via separate power conditioning paths which can dramatically increase scheme reliability.
Natural sine wave generation	The UPS output is a pure, natural sine wave that gives you a future-proofed UPS for ever-changing IT loads.
A damper cage for filtering harmonics	No additional harmonic filtering required; improves efficiency, saves space and cost.
Capable of active change in redundancy status	Optimising the UPS system based on the actual loads, giving higher levels of efficiency reducing risk to load.
Extremely low AC battery ripple	Lower AC ripple (compared with static) extends the service life of the battery.
Low internal sub-transient reactance	Clean voltage sine wave reducing voltage distortion for high harmonic loads, reduces the need for harmonic filters, saving money.

Solutions for every requirement

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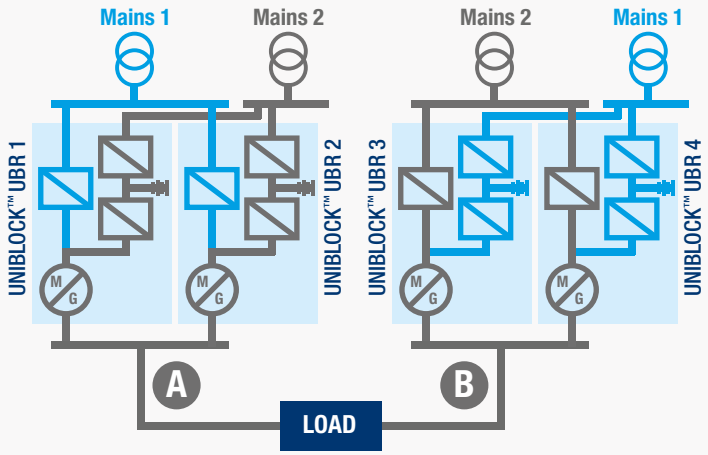
Fault Clearing Capability

The UNIBLOCK™ is inherently capable of clearing short circuit faults by virtue of extremely low sub-transient reactance, that approximates towards normal supply transformer impedances, ensuring fault-clearing current can be generated internally by the UPS. This capability represents a step improvement in fault tolerance of the power system when compared for example, to a conventional static UPS solution. With UNIBLOCK™ during fault clearing, full UPS function – including battery operation – is maintained and remaining loads are unaffected. The UNIBLOCK™ UBR assures that a localised fault won't take out the entire data centre.

This inherent ability to clear faults is a critical attribute in N+N system architecture where the load needs to be supplied by synchronous supplies from the independent UPS systems. Both independent UPS systems can be synchronised to each other and maintain full short circuit clearing ability under all operating modes. Other UPS systems are unable to provide a total fault clearing capability in order to remain synchronised.

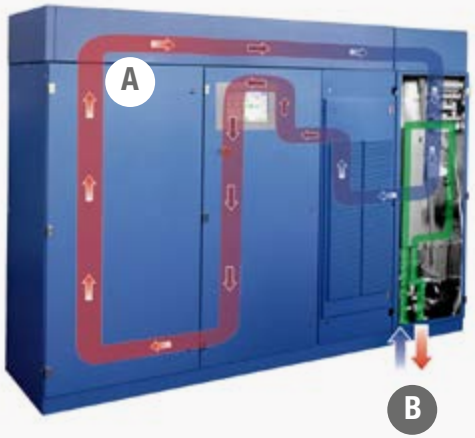
The unique configuration flexibility of the UNIBLOCK™ UBR means that a number of distinct system advantages can be utilised to facilitate the need to be concurrently maintainable and truly redundant. These advantages are not all available with other UPS technologies.

Feature	UNIBLOCK™ UBR	Example Diesel UPS	Example Static UPS
Number of full load power paths (including bypass) [1]	4	3	3
Number of conditioning power paths [1]	3	2	2
External system to system synchronisation [2]	■	■	■
Short circuit fault discrimination without Utility	■	■	–
Full UPS function without bypass	■	■	–
External synchronisation capability with full UPS function [2]	■	–	–
Isolated 4 pole N-E system capability (for S+S solutions) [3]	■	–	–
Full galvanic isolation [3]	■	–	–
Dual input capability for power conditioning paths [4]	■	–	–



1. The UNIBLOCK™ UBR is unique in providing power conditioning and isolation on three paths.
2. Static and Diesel UPS lose some functionality.
3. Without additional isolation transformers in Static and Diesel UPS, circulating currents can arise.
4. Input distribution failure does not force the use of emergency back-up mode and provides concurrent maintenance upstream.

UNIBLOCK™ UBR options



Cross section of water cooled unit

A: The enclosed air circuit is operated by an internal fan impeller incorporated in the rotor of the electrical machine.

B: The UNIBLOCK™ UBR with built in water cooling is connected to the chilled water circuit of the building.

UNIBLOCK™ UBR Water Cooled Option

The UBR integrated cooling unit provides the UPS system with its own climate. The UPS can be operated in small rooms, in harsh environments or locations containing dust or aerosols. Each water cooled UNIBLOCK™ UBR can be equipped with its own rated cooler. This means that no expensive air-conditioning or ventilation measures are necessary where chilled water is readily available.

Advantages

- Higher system efficiency
- Deployable in a polluted environment
- Lower investment costs
- Lower operating costs
- Smaller space requirement
- Reduced noise pollution
- One supplier, one service partner

UNIBLOCK™ UBR Containerised

As an alternative, the UNIBLOCK™ system is also available as a high-performance and economical container unit. All components necessary for operation are integrated and the system is immediately ready for operation after coupling to the AC supply system. This eliminates planning costs as well as the costs of integration into the building structure.

Containerised benefits

- Rapidly deployable
- No structural measures for noise attenuation, ventilation or cabling
- Minimal expenditure for on–site testing and commissioning
- No outlay on complex installation or plant room construction
- Temporary use in different locations or use in modular expansion
- Reduced on site programmes

Operator Control

The state-of-the-art touch control panel is designed for optimum performance. The clear layout and intuitively accessible control panel enables all operating states to be seen at a glance.

Detailed information on the condition of individual modules is immediately available. Additionally, built-in safety routines prevent unintentional switching operations. The optional remote control version offers remote monitoring and management, with simultaneous access to individual systems.

Touch Panel Features

- High resolution colour display
- Visualisation system for rapid capture of parameters such as current, voltage, frequency and phase
- Multi–lingual menu–driven operator prompts for fast access
- Field–proven, in–depth information for precise system monitoring
- Diagnostic system with built–in event monitor, storing the last 1200 events
- Battery monitor for battery parameters such as current, voltage and temperature

Taking care of your investment

After Sales Service

Piller believes that manufacturing a first class product with inherent high reliability is simply not enough. A UPS system must protect the client's interests just as well on its last day as it does on the first. The company prides itself in offering a worldwide network in the professional care of our clients' investment in Piller UPS through a team of highly trained and internationally coordinated technicians. At any moment, Piller technicians are taking care of over 9000 units of high power UPS equipment in over 40 countries, supporting clients' activities in data processing, banking and finance, industry, communications, aviation or defence, 24 hours a day, 365 days a year.

Emergency Response Service

Sometimes, support and expertise is needed when you least expect it. For those times, you need reassurance that help will be available in the shortest possible time. The Piller service centres are strategically positioned in relation to the installed base in order to provide both the best possible response time and local knowledge of the client's installation. Piller offers 24 hour emergency response and has technicians on standby for immediate dispatch at every one of our service centre locations.

Preventative Maintenance Service

Security of supply to the critical equipment is maintained by conducting correctly carried out periodic preventative maintenance. Preventative maintenance also minimises malfunctions and extends the life of the UPS system to 20 years or more.

Parts Availability

Piller preventative maintenance and emergency response services are fully supported by a network of stocked parts held both at the service centres and elsewhere in strategic locations around the world.

Consultation and Other Services

Ever changing demands in business can lead to the need for alteration, expansion or redeployment of a UPS system. Through Technical Support teams Piller can evaluate the requirements and advise on the necessary changes. They can also manage the delivery of these changes and consult with you and your partners to ensure the minimum of disruption.

- Replacement Battery Systems
- Reconfiguration and redeployment
- Upgrades
- Remote Monitoring Systems
- Site surveys

Operator Training

All newly installed systems will involve a degree of operator training conducted either at site or in one of our training centres. Piller offer further training by way of refresher courses and for new employees ensuring that client staff continue to have the skills necessary to operate the UPS system with the minimum of risk.

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HYBRID ROTARY UPS SYSTEMS
DIESEL ROTARY UPS SYSTEMS
STATIC UPS SYSTEMS
STATIC TRANSFER SWITCHES
KINETIC ENERGY STORAGE
AIRCRAFT GROUND POWER SYSTEMS
FREQUENCY CONVERTERS
NAVAL POWER SUPPLIES
SYSTEM INTEGRATION

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