

UNIBLOCK UBT Rotary UPS



from 400kVA-50MVA

Nothing protects quite like Piller

www.piller.com

Piller UPS

About Piller

Since its formation by Anton Piller in 1909, the company Piller has been synonymous with electrical machines of the highest quality and reliability. Today, Piller, from its headquarters in Germany and via its regional offices, representatives and distributors world-wide, continues that tradition into the 21st century.

Piller produces high performance power protection systems and converters. Combined with the highest levels of client support and engineering excellence available anywhere, Piller is internationally recognised as the most respected name in its field.

Piller is a wholly owned subsidiary of the multi-disciplined global UK engineering group, Langley Holdings plc. (www.langleyholdings.com)



The Problem

All around the globe complex electrical and electronic processes, information technology and automation govern our manufacturing, service industries, data management and communications. As these markets continue to become more global and in the endeavour to maintain a competitive position, much of which must be done faster and more effectively, even 24 hours a day every day. However, the nature of the problem varies significantly. In some cases, large scale power demands need only short term ride through and stabilisation. In other cases, aggressive industrial loads need UPS with high peak handling or large site distribution at medium voltage.

The Solution

The security of the power is assured through the use of Uninterruptible Power Supplies (UPS), whose sole purpose in life is to provide continuity and quality of power at all times. The Piller UNIBLOCK UBT is a UPS with complete flexibility for use in short term only ride through applications, or long term applications, or co-generation.



Maximum power supply when compromise is not an option

The UPS Principle

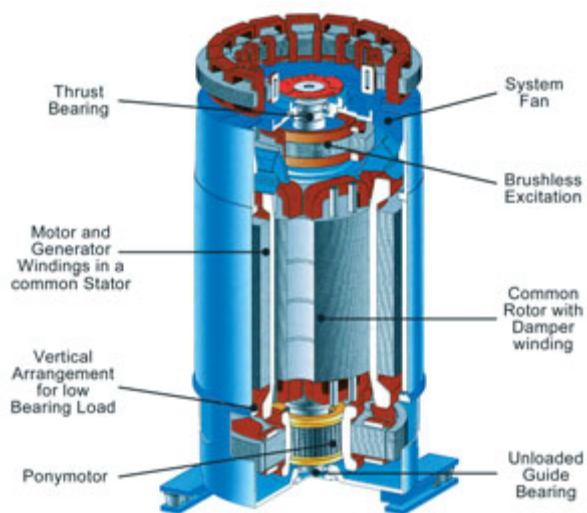
The system consists of the UNIBLOCK motor-generator, fully integrated into the switch-gear cabinet. The load is normally fed via an isolating and coupling choke connected to the utility supply.

The choke has a second tapped connection to the motor-generator. In the event of short interruptions or complete outages, the load is supported by a source which can be either a conventional battery system or a Piller Powerbridge (kinetic energy store device). The choke provides near total isolation across the UPS meaning that non-linear (harmonic rich) loads can be fed by the UPS whilst the source sees an almost perfect sinusoidal input current.

This UNIBLOCK UBT UPS principle offers exceptionally high efficiency.

The UNIBLOCK Machine

At the heart of every Piller Rotary UPS is the UNIBLOCK machine combining a motor and a generator in one, three-phase synchronous unit. The windings of both components are incorporated in a shared stator and are excited by a common rotor. A damper winding absorbs current harmonics,



irrespective of load current and load power factor. The energy transfer from the motor to the generator takes place via direct magnetic coupling without loss and without electro-mechanical conversion.

The UNIBLOCK has a high load-carrying capacity and is a robust, highly efficient design.

UNIBLOCK UBT

Frequency	50 Hz	60 Hz
Voltage	380 V up to 25kV	380 V up to 25kV
Module Ratings	400 kVA - 2 MVA	400 kVA - 2 MVA

Innovation for your benefit

The UNIBLOCK UBT

Feature	Benefit
Highest Efficiency	A truly green solution for medium to high power applications, resulting in minimised losses and low running costs for your site.
Flexible ride-through	A choice between batteries and Powerbridge allows the system to be optimised whilst balancing carbon emissions and renewables issues.
Power Quality Improvement	Compensation for low input voltage, including sags to 50% of nominal. Protects against brownouts (-30%) without using stored energy. Handles 100% non-linear loads. Exceptional step load response. Stable output frequency including 100% load changes. Reduces the risk of failure to your site.
Harmonic Attenuation	Bi-directional isolation of harmonics between load and supply, without capacitive filters. Reduces failures and replacement item costs for your site.
Power Factor Correction	Isolation of poor power factor loads from the utility. Input power factor typically $\cos \varphi = 0,99$ max. at full load, eliminating the need for power factor correction capacitors. Reduces power factor related energy costs and replacement item costs.
Design Flexibility	The same concept can be used to address low and medium voltage applications, cooling can be by air or chilled water, ride through storage can be batteries, flywheel or mixed. Can be independent, with standby generator or with co-generation.
Special alternator/choke characteristics	High fault clearing capacity for system co-ordination. Bridging of upstream faults without disconnection of the input. Reduces the risk of system failure.
System Reliability	Capacitor-free design eliminates the highest failure components. Durable rotary technology is less sensitive to overloads and electrical disturbances. Simple mechanical system, no brushes or slip rings or complex bearing arrangements. Reduces the number of failures and safeguards your site against changes in load profile.
Highest module power	Maximised net to gross building space. Lowest capital cost for super-high density applications. Reduced maintenance costs.
Bi-directional storage (Powerbridge)	Superior frequency stability on both load acceptance and rejection. Reducing problems for your critical loads.
Simple maintenance	No complicated and prolonged overhaul requirements. Minimises risk and cost.
Optimised design	Lower Total Cost of Ownership.



Fewer components, many functions

Low Total Cost of Ownership

The Total Cost of Ownership (TCO) for any UPS is often oversimplified. It is a combination of the capital expense for the UPS, the electrical operating costs, the routine maintenance and overhaul. However, it is also dependant upon the required surrounding infrastructure which has to include switchgear, cabling, power factor correction and cooling needs together with building space costs and reduction in net useable space. When properly addressed, the TCO analysis will often show that there is a significant reduction in pay-back period if the right solution is adopted.

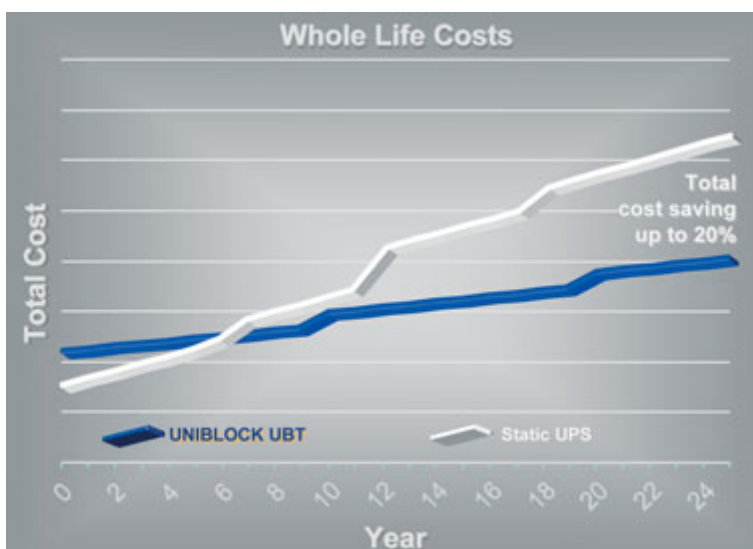
The UNIBLOCK UBT guarantees lower operating and maintenance costs through:

- Very simple, economic maintenance and overhaul
- Elimination or reduction of air conditioning requirements
- Reduced space requirement
- Cyclic maintenance and care work all undertaken on site
- Extremely high electrical efficiency
- Optimised system design

Reliability

Owing to their particular reliability, UNIBLOCK systems are the only alternative today when low maintenance costs and long life must be obtained in the higher power ranges. The Piller UNIBLOCK UBT characteristics are:

- MTBF of 1.38 million hours
- Proven reliability due to the use of Piller motor/generator combinations in thousands of units
- Fully redundant control electronics and robust power semi-conductors ensuring the highest reliability for the system as a whole
- Brushless design and a simple bearing arrangement that is greased while the Piller UNIBLOCK machine is operational



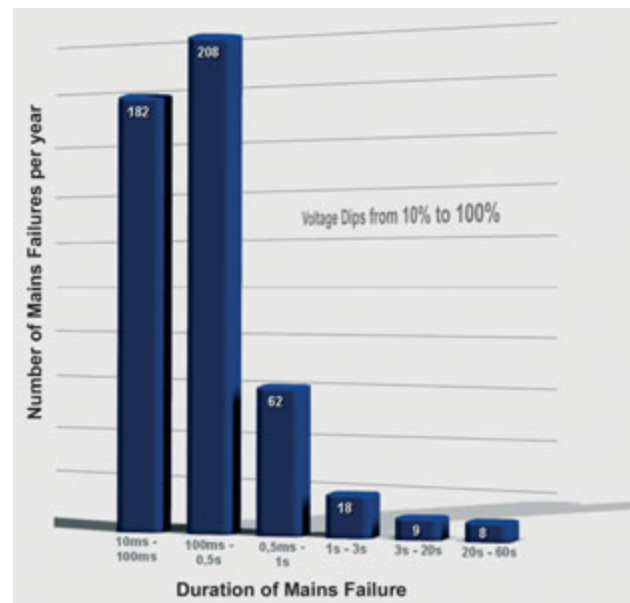
*'UNIBLOCK UBT -
lower operating and
maintenance costs'*

Your requirements determine the solution

Optimised Protection

Research shows that, in Europe for example, mains disturbances lasting more than 10ms occur almost daily, jeopardising or substantially disrupting the operation of electrical equipment. Over 60% of all mains failures last more than 100ms and yet only some 2% continue for more than a few seconds. In countries where the power supply grid is still developing, the statistics show more outages which also tend to be longer.

The unique design of the Piller UNIBLOCK UBT gives a sufficient ride-through capability for virtually all outages (>98%) regardless of the ride-through option.



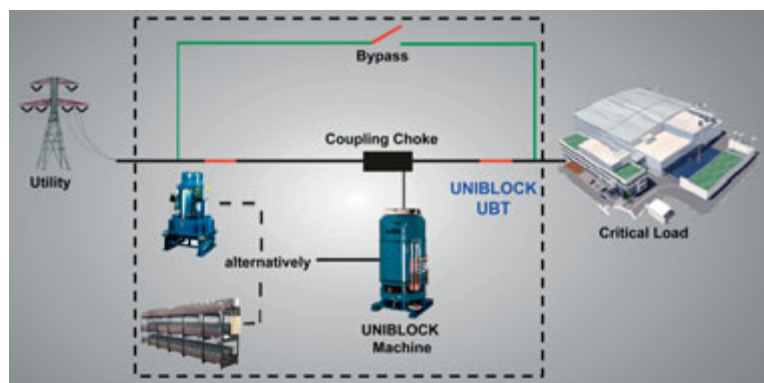
Configuration options



The Stand Alone UBT

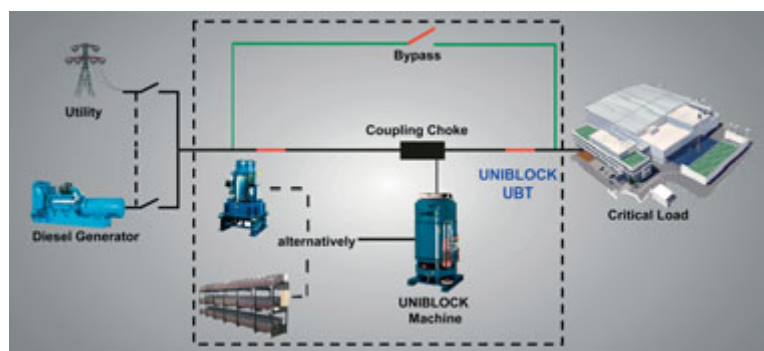
In normal operation, load is fed from the utility via a coupling choke. This choke is precisely balanced with the motor generator so that disturbances on the utility side are prevented from crossing to the load side. Furthermore, harmonic load currents are supplied from the motor generator and not the utility, giving rise to a sinusoidal input current. The coupling choke also allows for a very wide input voltage deviation whilst maintaining narrow tolerances at the output. Even under the most adverse upstream short circuit fault conditions, this equipment inherently limits reverse fault current to less than 2x nominal.

The Piller UBT Rotary UPS can easily be employed in either low or medium voltage systems.



The UBT with Standby Generators

The UBT can easily be integrated into a system with separate standby generators to give long term ride-through. The generators can be remote to the UBT and even in different voltage elements of the system. Due to the ride-through energy being between the load and standby generator, the Diesel engine sees no significant load step. Also, unlike static UPS systems, no over-dimensioning of the standby generator is necessary because only real power comes from this source and the reactive power comes from the UNIBLOCK machine itself.



Configuration options

The UBT with Co-Generation

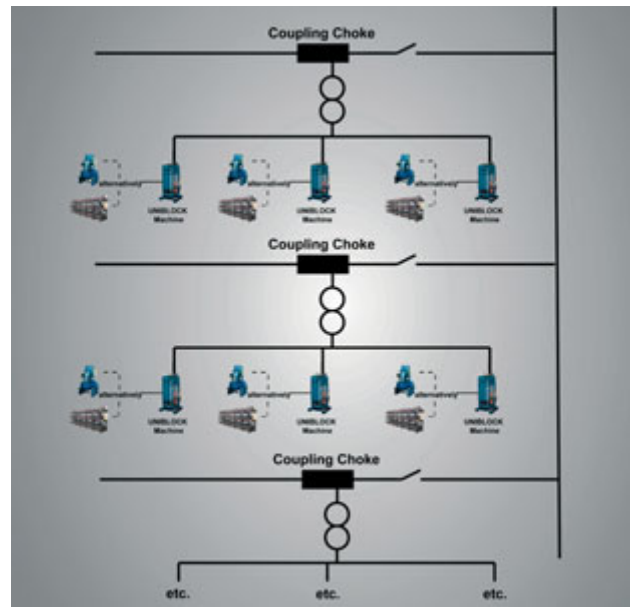
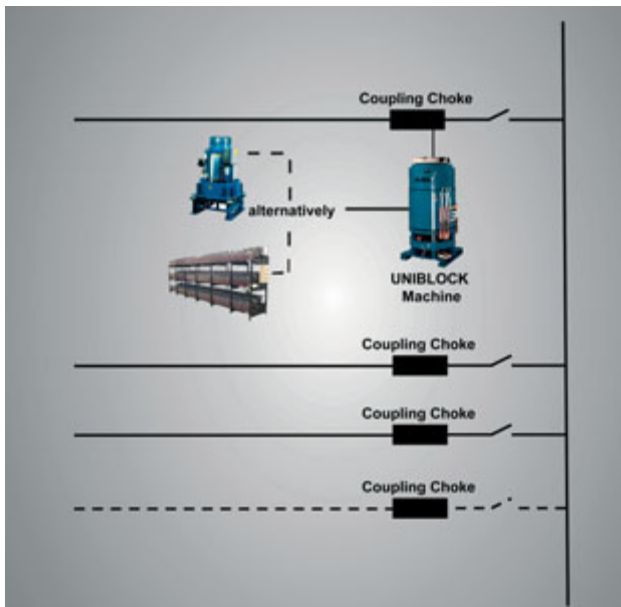
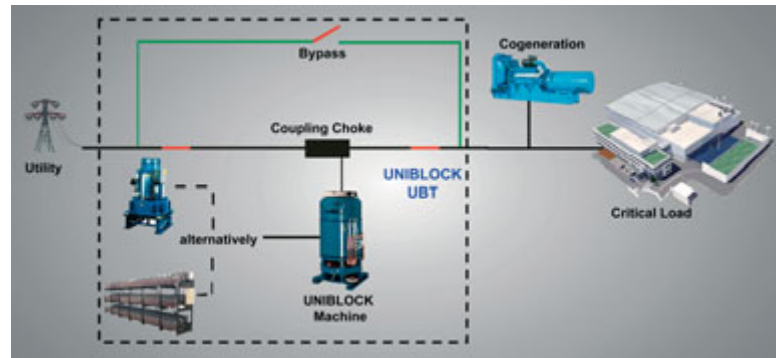
Co-generation plants are designed to make use of both the electrical energy generated and the heat by-product. Such systems, by themselves, have the advantage of much improved overall efficiency but they tend to have extremely poor dynamic behaviour.

The UBT can be used to provide a link between the normally autonomous co-generation plant and the utility such that power quality is maintained either in utility operation or in island mode.

Excess power from the co-generation plant can be exported to the utility (subject to local regulations) with the safe knowledge that the UBT will isolate any effects arising from utility failure.

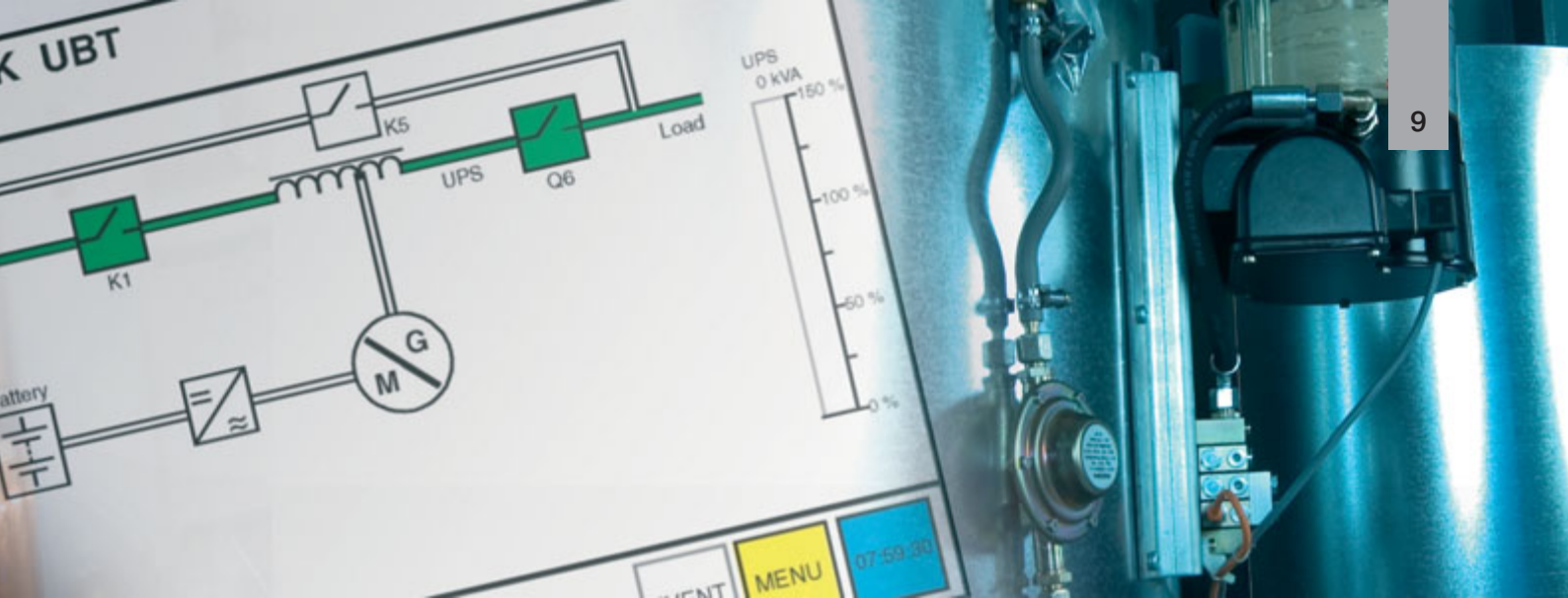
The UBT in High Power Applications

UNIBLOCK UBT Rotary UPS can be paralleled to 50 MVA (less at low voltage), either with individual or common coupling chokes.



Other configurations are easily realised:

- Hot standby
- Parallel redundant
- System + system
- Isolated parallel bus
- Isolated redundant
- Common or individual bypass arrangements



Energy Storage Systems

POWERBRIDGE option

Piller offers a battery-free option which gives the designer the chance to save space and maximise power density per unit.

Not only that, but the Powerbridge will absorb energy at the same rate as it can dissipate. This means that frequency stability under dynamic load conditions cannot be matched by any other kinetic storage solution.

With up to 21MWh energy stored in Piller's Powerbridge the ride through time is almost double that of the alternatives.



Battery option

The Piller UNIBLOCK UBT is also available with an option for batteries as the ride through source. The efficiency of a battery solution is superior to any equivalent kinetic energy solutions but this must be traded against space. The UNIBLOCK system is also battery friendly, maximising their service life and reducing costs. The batteries are not

subject to constant harmful DC ripple currents from rectifier-inverter operation, and the UNIBLOCK's inherent kinetic energy enables micro-breaks to be bridged without cycling the DC support.

UNIBLOCK UBT Containerised

As a variation to the plant room solution, Piller UNIBLOCK UBT is also available as a containerised unit. All components necessary for operation are integrated into the container making the Piller UNIBLOCK UBT a transportable UPS system ready to set to work in a variety of locations or where programme prevents protracted site activity.

Advantages:

- Operating readiness immediately on connecting to the mains
- No structural measures for noise attenuation, ventilation or cabling
- No expenditure for on site testing and commissioning
- No outlay on complex installation or plant room construction
- Temporary use in different locations
- Reduced on site programme



'UNIBLOCK UBT has the greatest flexibility'

PILLER

UNIBLOCK UBT user-friendly touch control

Operator Control

The state-of-the-art touch control panel is designed for optimum man/machine communication. The clear layout and intuitively accessible control panel has been made fully user-friendly. A built-in mimic display with clear symbols allows all operating states to be seen at a glance. Detailed information on the condition of the individual modules is immediately available. Additionally, interactive communication with built-in safety routines prevents unintentional switching operations.

Touch Panel Features

- High resolution colour display
- Visualisation system for rapid capture of parameters such as current, voltage, frequency and phase
- Multi-lingual menu for use in specific countries
- 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
or
Flywheel status monitoring



Unrivalled after sales service

Competence and responsiveness are the watchwords of our business.

Piller believe that product and service belong together, and the Piller name is synonymous with excellent after sales service. The best technology is only as good in the long term as the service that underpins it.

For this purpose, a comprehensive network of qualified service staff is available – world-wide.

The premium quality and technical maturity of every Piller product already guarantees a high degree of functional security, and together with quality maintenance, this further reduces any risk of possible breakdown.

Piller offers a comprehensive package of services tailored to your requirements:

- **Technical consultation**
- **Operator training**
- **Functional testing**
- **Maintenance**
- **Fault analysis and troubleshooting**
- **Customer training**
- **Remote system diagnosis and support**
- **24/7/365 emergency call-out**



Service Team Capability

Piller's customer service engineering team is highly qualified and trained on all products and services. As a combined total, field service teams have centuries of experience working on four generations of UPS system. Piller operate a 'best of breed' philosophy in all working practices and are believed to be market leaders in first time resolution of site problems.

Piller Emergency Call-Out Service

Piller understand that malfunctions also occur outside working hours, which is when competent help is needed quickly. An emergency call out service ensures that a Piller Service specialist can be reached quickly. Service centres are strategically positioned in relation to Piller's installed base, for the best possible response time and familiarity with every installation.

'on demand 24 hours a day, 365 days a year'

PILLER

ROTARY UPS SYSTEMS
HYBRID ROTARY UPS SYSTEMS
ROTARY DIESEL 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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