

**TECHNIK**

**UNIBLOCK UBSF - Frequency converter**



**Nothing protects quite like Piller**

# Frequency conversion

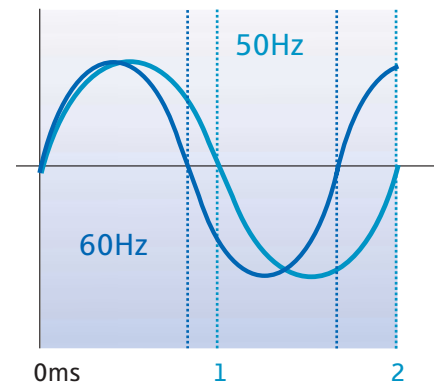
... with UNIBLOCK UBSF technology.

Many industrial applications as well as naval power systems require a power supply with a frequency of 60Hz. As this cannot be provided by the utilities, converters are employed which, on one hand, provide the necessary voltage and frequency, and on the other hand eliminate irregularities. PILLER has many years experience internationally in high-performance power systems. Based on the proven reliability and economic efficiency of more than 5000 installed rotary uninterruptible power supplies world-wide we have developed the PILLER UNIBLOCK-SF - an unique frequency converter.

## System description

The applied AC input voltage (380 - 415V, 50Hz) is converted into a DC voltage in the so-called DC link circuit. The DC link circuit basically comprises a 12-pulse three-phase rectifier bridge, to reduce system harmonics at the input. The rectifier voltage is fed to the inverter via the DC link circuit chokes to the UNIBLOCK machine.

The inverter converts the DC voltage into a three-phase AC voltage 60Hz. As a thyristor converter it operates as a machine-commutated inverter, i.e. the phase control of the thyristors is provided by the terminal voltage of the UNIBLOCK machine.



This is possible because the UNIBLOCK machine is operated at constant AC voltage. Commutation power required by the thyristor converter is therefore provided by the UNIBLOCK machine. The power to operate the UNIBLOCK machine is taken from the DC link circuit via the inverter.

The generator winding supplies the load with the same dynamic characteristic as an ideal AC supply system.

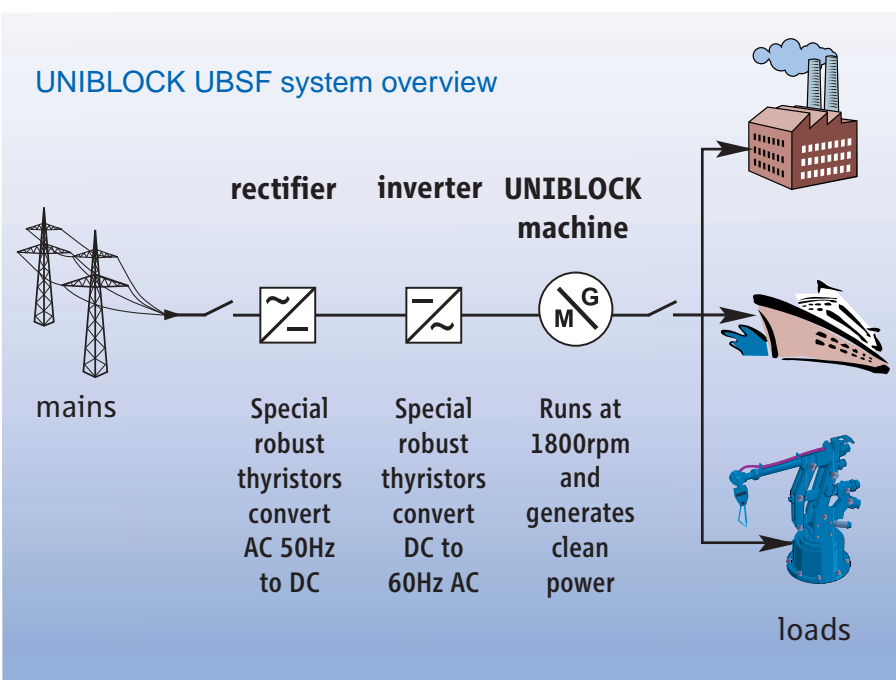
### Available models:

Single module ratings	150 - 1300kVA
Input	380 - 415V, 50Hz
Output	440 - 480V, 60Hz
Option	Full UPS function with battery

Peak currents are delivered by the generator without being limited by the current ratings of additional semiconductors. The impedance of the generator - which is similar to that of the AC line - delivers a short-circuit current of up to fourteen times the rated current of the frequency converter. The sinusoidal voltage generated by the UNIBLOCK-SF design requires no unreliable capacitor filter circuits. The brushless excitation of the motor/generator is provided by an exciter and mounted on the same shaft.

The unique UNIBLOCK technology therefore offers low maintenance and high efficiency which results in significantly lower life-cycle cost.

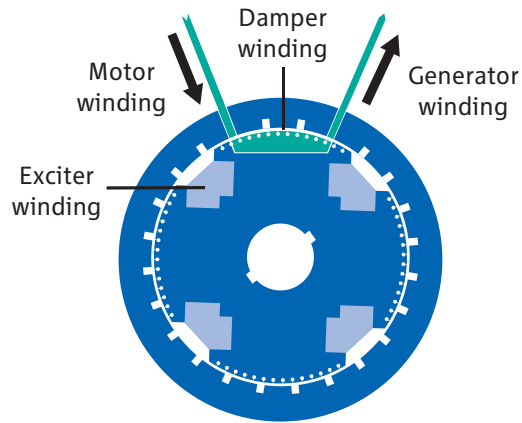
## UNIBLOCK UBSF system overview



## Innovation for your benefit

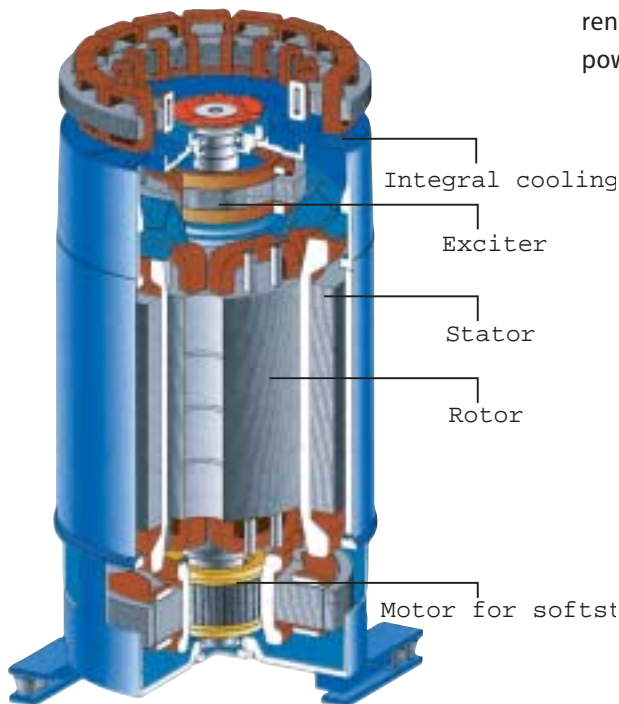
The construction principle of the PILLER UNIBLOCK system combines a motor and a generator in one, three-phase synchronous machine. The windings of both components are incorporated in a shared stator and are excited by a common rotor.

The energy transfer from the motor to the generator takes place via direct magnetic coupling without losses and without electro-mechanical conversion. This provides electrical isolation between the mains supply and the load. The advantage of this construction is a machine with high performance: the machine is robust, wear-free, highly efficient, can be loaded continuously and overloaded and has outstanding technical characteristics.



- Motor winding for rotating magnetic field.
- Damper cage filters harmonics.
- Exciter winding for constant magnetic field.
- Generator winding for flawless sinewave.

The PILLER UNIBLOCK prevents load disturbances reaching the mains: the damper cage absorbs current harmonics and reactive currents, irrespective of load current and load power factor. Unbalanced loads are equalized.

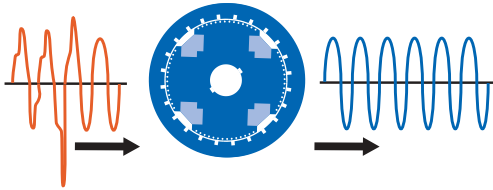


The PILLER UNIBLOCK machine

## Considerable advantages

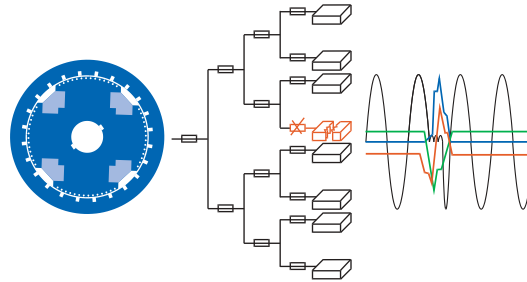
### Input

- Mains glitches are fully suppressed.
- Electrical isolation protects the loads.
- Symmetrical input current.
- Voltage tolerance: +10% / -15% continuous, -20% up to 2 hours.



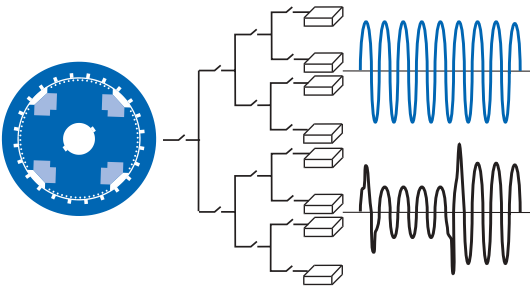
### Fault discrimination

- 14-times rated current guarantees disconnection of faulty load within 10ms.
- The remaining loads are unaffected.



### Constant voltage supply

- 100% load step possible.
- Inrush load currents up to 3-times the rated current.
- Overload capability up to 150% load for 2 minutes.
- 100% unbalanced load possible.
- Full power factor range.
- Excellent dynamic load performance.



### Free choice of load

- Low source impedance.
- Linear internal resistance.
- Unlimited crest factor.
- Distortion factor 1.5% at linear load.

### General advantages

- High efficiency, high reliability.
- No additional fans required - the cooling is provided by UNIBLOCK machine.
- Microprocessor control and regulation.
- Proven quality due to long experience in manufacturing of rotary solutions.
- Low operation and maintenance costs.
- Paralleling capability without additional synchronisation or load sharing devices.
- Easy installation.
- Small foot print and compact design.





## Unrivalled after sales service



Across the globe the Piller network is committed to delivering world-class service resources and Piller clients can always be confident that a highly qualified team of service and support technicians are there to uphold the very best standards of customer care.

Services range from installation and commissioning to predictive analysis, emergency call-out, spare parts, planned maintenance and training. Sophisticated remote monitoring can track a system's operating status at any time, anywhere. With the Piller "Total Care" programme, Piller simply takes care of everything.

- UPS maintenance
- Battery maintenance
- Technical support
- Operator training
- 24 hour call-out
- Temporary UPS systems
- Comprehensive spares
- Remote monitoring



*'...with the "Total Care" programme, Piller simply takes care of everything.'*



**Piller Power Systems GmbH**

Abgunst 24  
37520 Osterode,  
Germany

T +49 (0) 5522 311 0  
F +49 (0) 5522 311 414  
E info@piller.com

- DYNAMIC UPS SYSTEMS
- STATIC UPS SYSTEMS
- STATIC TRANSFER SWITCHES
- KINETIC ENERGY STORAGE
- AIRCRAFT GROUND POWER SYSTEMS
- FREQUENCY CONVERTERS
- NAVAL POWER SUPPLIES
- SYSTEM INTEGRATION

**Piller Inc.**

45 Turner Road, Middletown  
New York 10941-2047  
USA

T +1 800 597 6937  
F +1 845 692 0295  
E usmail@piller.com

**Piller (UK) Limited**

91 Chesterton Lane, Cirencester  
Gloucestershire GL7 1YE  
England, UK

T +44 (0)1285 657 721  
F +44 (0)1285 654 823  
E ukmail@piller.com

**Piller (France) SAS**

107-111 Av, Georges Clémenceau  
B.P. 908, F-92009 Nanterre Cedex  
France

T +33 (0) 1 47 21 22 55  
F +33 (0) 1 47 24 05 15  
E francemail@piller.com

**Piller (Australia) Pty. Ltd.**

Unit 10/10 Victoria Avenue  
Castle Hill, NSW 2154  
Sydney, Australia

T +61 2 9894 1888  
F +61 2 9894 2333  
E australiamail@piller.com

**Piller (Iberica) S.I.**

Paseo de la Habana, 202 Bis  
E-28036 Madrid  
Spain

T +34 91 35 05 966  
F +34 91 35 01 633  
E ibericamail@piller.com

**Piller (Italia) S.r.l.**

Piazza Pertini n. 19  
I-20067 Paullo, Milan  
Italy

T +39 02 9063 3780  
F +39 02 9063 3788  
E italiamail@piller.com

Representatives and Distributors in:

- ARGENTINA . AUSTRIA . CANADA . CHILE . CHINA . DENMARK . DUBAI
- ESTONIA . FINLAND . HONG KONG . HUNGARY . INDIA . INDONESIA . JAPAN
- KOREA . LATVIA . MALAYSIA . NETHERLANDS . NORWAY . PHILIPPINES
- POLAND . RUSSIA . SERBIA . SINGAPORE . SOUTH AFRICA . SWEDEN
- SWITZERLAND . TAIWAN . THAILAND . TURKEY . UKRAINE . USA



[www.piller.com](http://www.piller.com)

The information contained within this brochure is deemed to be correct at the time of going to press. Due to the policy of continued improvement, we reserve the right to change any specification without prior notice.  
ERRORS & OMISSIONS EXCEPTED

PPS DYN 0001/06/05/1 Printed in England



A Langley Holdings Company