

S500 3:3 250 to 800 kVA/kW



FINANCE



TELECOMMUNICATION



ENERGY



MEDICAL



GOVERNMENT

VFI
type

UPS ONLINE



TOWER

PF=
1,0

POWER FACTOR



SERVICE

S500 is the latest UPS series designed for mission critical applications.

The three-phase UPS offers transformer-free double conversion technology VFI SS 111, with integrated the latest IGBT three-level design.

S500 is designed to meet the power requirements of tomorrow, offering the highest efficiency in the market and low running cost. Thanks to the Efficiency Control System (ECS).

S500 also guarantees the highest levels of efficiency even at partial loads.

Its unity power factor and easy system upgrading make it the ideal solution for the business continuity of any IT application.

HIGHLIGHTS

- High efficiency up to 97% in double conversion
- kW = kVA (pf 1) up to 40°C
- Transformer-free UPS
- Peak shaving
- Active Filter Mode (ACTIVE ECO)
- Colour LCD Touch Screen
- Full front access, back-to-back instal

SATRON UPS **S500** is the latest UPS series designed for mission critical applications as Data Centres, communication networks, commercial and industrial installations.

The three-phase UPS offers transformer-free double conversion technology VFI SS 111, with integrated IGBT three-level design.

S500 is designed to offer unsurpassed performance and meets the power requirements of tomorrow. **S500** is fully scalable to evolve with growing business demands. It offers the highest level of power availability as well as reduced TCO, minimum energy consumption and CO2 emissions. Its unity power factor and easy system upgrading make it the ideal solution for the business continuity of any IT application.

Thanks to its fault tolerant architecture, concurrent maintainability and hot scalability, **S500** guarantees continuous operation and premium protection for your customers' business.

ZERO IMPACT SOURCE AND PEAK DEMAND MANAGEMENT

S500 is designed to offer unsurpassed performance and meets the power requirements of tomorrow. **S500** is fully scalable to evolve with growing business demands. It offers the highest level of power availability as well as reduced TCO, minimum energy consumption and CO2 emissions. Its unity power factor and easy system upgrading make it the ideal solution for the business continuity of any IT application.

is designed with the latest technology to prevent disturbances on the mains and is able to “clean” the power from e.g., harmonics generated by non-linear loads. The input AC/DC converter is based on the IGBT rectifier design using the latest 3-level technology.

The key features are:

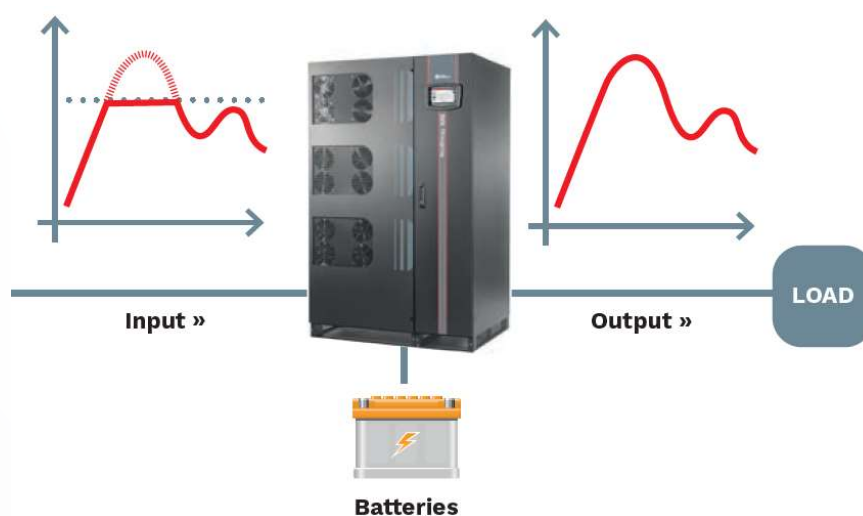
- Input current distortion <3%.
- Input power factor 0.99.
- Power walk-in function that ensures progressive rectifier start up.
- Start-up delay function, to restart the rectifiers when mains power is restored.

PEAK SHAVING FUNCTION

Thanks to the possibility to set the maximum input power (kW or kVA), **S500** can be installed into AC supply systems with limited power availability such as a diesel generator or contractually reduced power sources and then supply the additional power required using the batteries (Peak Shaving function).

S500 offers 3 peak shaving operation modes:

- Static: the S500 input power is programmed at commissioning time.
- User Remote control: the user decides when reduce the input power of the UPS via commands.
- Dynamic: the peak shaving works automatically as per the site conditions.



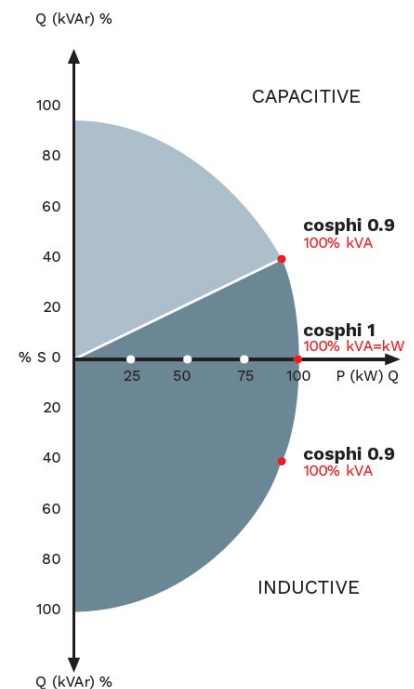
OUTSTANDING PERFORMANCE

The latest technology of **S500** and the careful selection of high-quality components help to achieve first-class performance such as unity power factor (kVA = kW) and the capability to supply capacitive loads, which are very common in most Data Centers, without any power derating up to 40 °C.

Outstanding system efficiency up to 97% in ON LINE Mode, increasing to 98.5% in ACTIVE ECO Mode and 99% in ECO Mode.

Specific attention has been given to the ventilation system to ensure the best operational level and long lifetime. This is possible thanks to the automatic fan speed control which constantly adjusts to the specific load level, the fan failure alarm and the fan redundancy architecture.

S500 is capable to work at very high ambient temperature, over to 40 °C. The UPS is designed with consistent safety margins granting operation up to 55 °C (condition apply).



SMART BATTERY MANAGEMENT (SBM)

The battery system is the energy reserve in every UPS installation and consequently a fundamental asset in every power continuity plan to ensure the correct operation in case of mains failure. This asset must be carefully managed. **S500** includes all the latest features supervise, to prolong the battery life and keep the battery working efficiently, as well as advising users about any potential problem.

In addition, **S500** allows flexibility on the number of battery cells to choose the most cost-effective solution for the required backup time. The battery charging and discharging is assured by the STEP-UP/STEP-DOWN converter which means that when the batteries are charged and the mains is available, the battery is no longer connected to the supply. This means the ripple current is practically zero which leads to a significant improvement in battery life.

FLEXIBLE BATTERY STORAGE

S500 offers complete freedom to choose the best energy storage device for each type of installation or application.

The variety of the charging methods in conjunction with the flexibility offered by the power electronics and the decades of field experience allow to use **S500** in conjunction with all the most common type of battery technologies available in the market like VRLA, AGM, GEL, NiCd but also with other type of energy accumulators as Li-ion Battery solutions.

For short back-up time from some seconds up to a couple of minutes **S500** is released to work also with Supercapacitors, a very reliable technology for such applications.

CAPACITY AND INSTALLATION FLEXIBILITY

S500 is designed to guarantee maximum cost savings (TCO) and flexibility of installation to adapt to every need and situation.

The UPS ventilation is from the front of the cabinet to the top, so no additional rear clearance is required, allowing vast range of layouts configurations, whether it be a straight row, back to wall or back-to-back, the system easily adapts to available floor space.

- The small footprint of the cabinet and complete front access for all maintenance activities, ensures maximum space for installation and service.
- **S500** includes top and bottom cable entry (on S500 250, 500 and 600 top on option).
- Operation without Neutral: **S500** can work with (4 wire) or without (3 wire) the neutral line connection This is an important feature to reduce the TCO of the distribution system, where the neutral line cable is not distributed - savings investment - and the neutral is created by an isolation transformer close to the load.
- This is an important feature to reduce the TCO of the distribution system, where the neutral line cable is not distributed - savings investment - and the neutral is created by an isolation transformer close to the load.
- This is a typical infrastructure solution adopted by modern Data Center or for installations where the neutral is not used at all, allowing not only reduced cost for the distribution arrangements but also effortless replacement of legacy equipment.



4-wire (L1-L2-L3-N) installation



3-wire (L1-L2-L3) installation

MAXIMUM RELIABILITY AND AVAILABILITY

S500 architecture and features deliver significant cost savings thanks to an easy adapting to new or existing installations without impacting power infrastructure. This is possible through scalability, granting minimised initial investment (CAPEX), adding power cores as business demands grow.

- Parallel configuration up to 8 units **S500** UPS can be connected in parallel with up to 8 units to increase the capacity or add redundancy (N+1). Parallel configuration with com
- EFFICIENCY CONTROL Mode (ECM) Considering that a typical UPS load can vary from 20% to 80%, the ECM function optimises the operating efficiency of a parallel UPS configuration according to the power absorbed by the load: in case of low load, it sets some UPS in “freeze” mode, ensuring redundancy and a working point of the “live” UPS in the higher efficiency working point, during all load conditions.
- Hot System Expansion (HSE) allows the addition of further UPS into an existing system, without the need to switch off the operational units or switch to bypass.

OPERATION MODES

S500 UPS can operate in many Operation Modes, in order to grant always the maximum level of protection and maximum level of efficiency, based on mains quality and load type.

ONLINE MODE

It provides the highest level of power conditioning and protects the load from all electrical network disturbance in terms of voltage and frequency. The overall AC/AC efficiency is up to 97%.

ECO MODE

The load is normally powered from the bypass line while the rectifier keeps the battery charged. When the mains exceed the limits the load is automatically transferred in ON LINE Mode in approx. 2 ms The efficiency is more than 99%.

ACTIVE ECO MODE

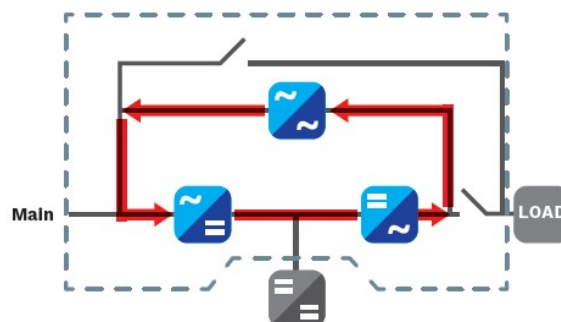
In this mode the **S500** works as Active Filter: the bypass line is the main source and supplies the active power while the inverter only provides the reactive part of the load. This ensures that the UPS input power factor remains close to unity, regardless of the load power factor. In addition, the inverter operation reduces significantly the harmonic content (THDi) applied to the mains supply. In case of mains failure, the transfer time on Inverter is approximately 0 (classified VFD SS 111). Power factor correction plays an active role in reducing the installation's TCO: it means reduction of Joule losses and voltage drop, for an optimum sizing of electrical equipment such as power transformers, cables, busbars, switch and protection devices. The electric distribution is more efficient and stable. Also, the current distortion (harmonics) generated by non-linear loads such as inverters, computers, drives and so on causes several problems in an electric system. It is important to reduce it. ACTIVE ECO Mode combines high level of availability with important CAPEX and OPEX reduction. The efficiency is more than 98.5%

SMART ACTIVE MODE

S500 automatically defines whether to operate in ON LINE and/or ECO Mode, this is selected by monitoring the performances of the bypass supply, if this remains stable for a defined period the system stays in ECO Mode otherwise in ON LINE Mode. In SMART ACTIVE operating mode, the **S500** can combine the superior availability of a double conversion (ONLINE) operating mode with the excellent energy cost savings of a high efficiency mode (ECO Mode) for a reduced total cost of ownership.

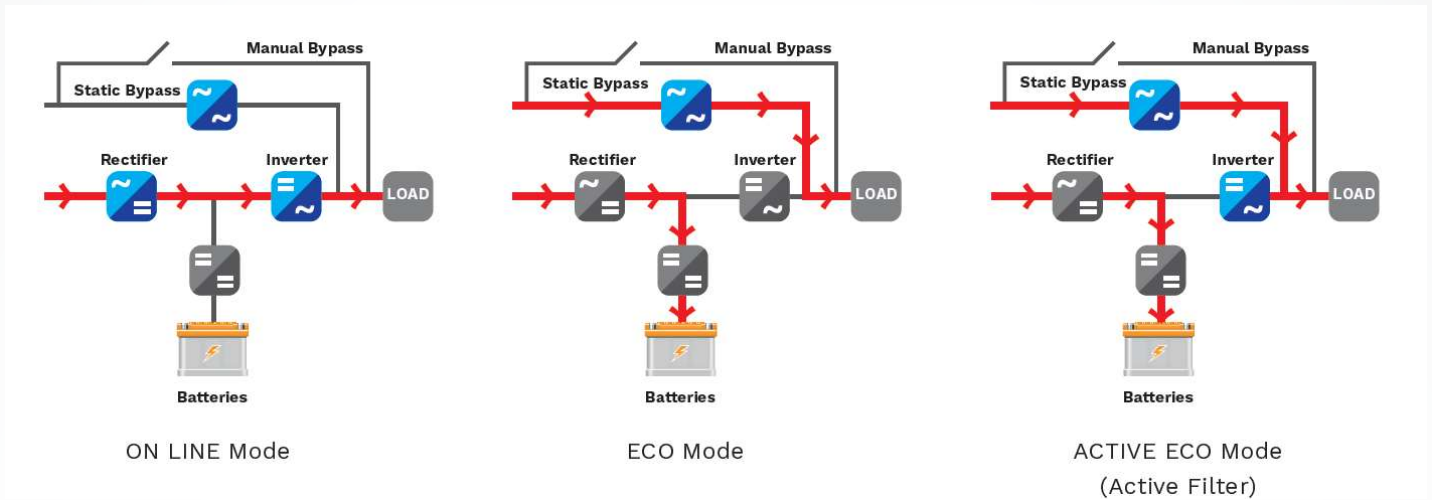
SMART CAPACITY TEST (SCT)

Thanks to the Smart Capacity Test (SCT) functionality (Load Test mode) the system can be tested onsite during the commissioning, before it is connected to the real load, without using costly temporary loads, cabling and breakers and without wasting energy from the power network. In this condition the UPS output supplies energy to the input in re-circulating mode. In this mode S500 is low consuming, just the energy due the internal losses.



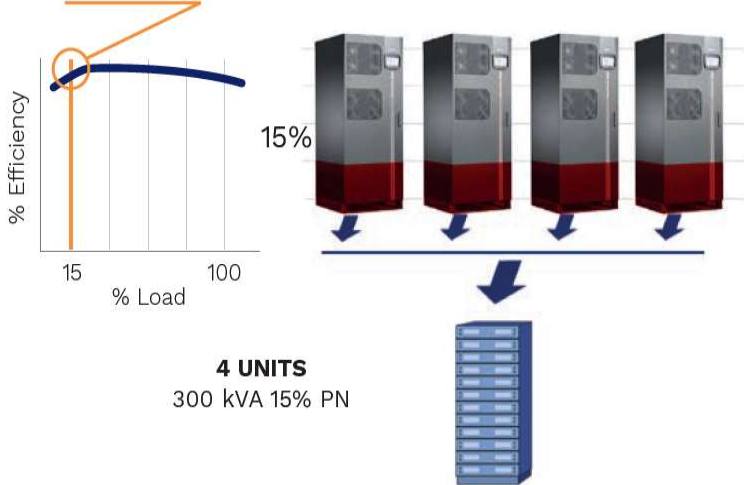
No need to use costly temporary loads, cabling and breakers. No waste of energy.

OPERATION MODES

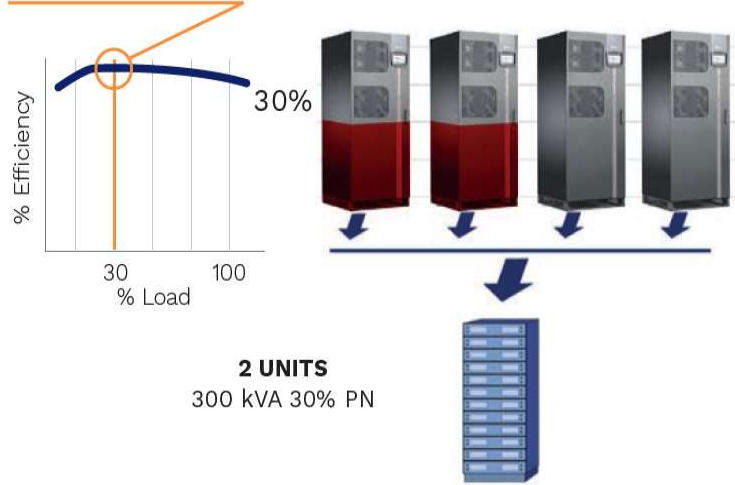


EFFICIENCY CONTROL MODE (ECM)

THE UPS WORKS IN A LOW EFFICIENCY WORKING POINT



THE ACTIVE UPS WORKS IN A HIGHER EFFICIENCY WORKING POINT



COLOUR LCD TOUCH SCREEN

Users can benefit from an advanced operation and supervision systems developed specifically for IT personnel, facilities managers and service engineers to ensure that the UPS setup, control and monitoring is easy.

S500 is equipped with an LCD touch screen 7" graphic display (800x480 pixels) providing in a user-friendly graphical interface the UPS information: line mimic diagram showing system status, dashboard style indicators for all the system values and conditions, voltage and current waveforms, operating states and alarms. The panel is used for configuration and setting the parameters of the UPS with high security access thanks to 3 separate password levels for users and service engineers.

The main features are:

- High security access with separate password levels for users, technician and service engineers.
- User-friendly graphical interface.
- Single-line mimic diagram showing system status.
- Contemporary dashboard-style indicators for major system values and conditions.
- Automatic charting display for logged power and environmental data.

ADVANCED COMMUNICATION AND SUPERVISION

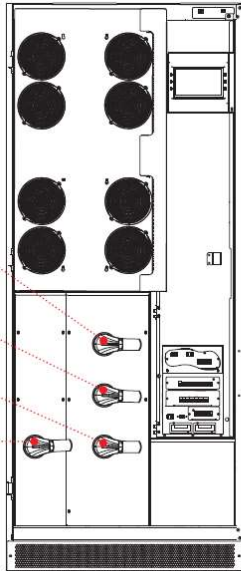
S500 offers wide communication and supervision tools and interface granting an easy integration into any building management system (BMS) and Data Center infrastructure (DCIM).

- PowerShield3 monitoring and shutdown software for Windows operating systems 11, 10, 8, Server 2022, 2019, 2016 and previous versions, Windows Server Virtualization Hyper-V, macOS, Linux, Citrix XenServer and other Unix operating systems.
- SATRON Connect for remote monitoring service.
- 2 slots suitable for the installation of the communication accessories such as network adapters and BMS interface.
- Ethernet and USB ports.
- Relay cards with customised alarms and commands.

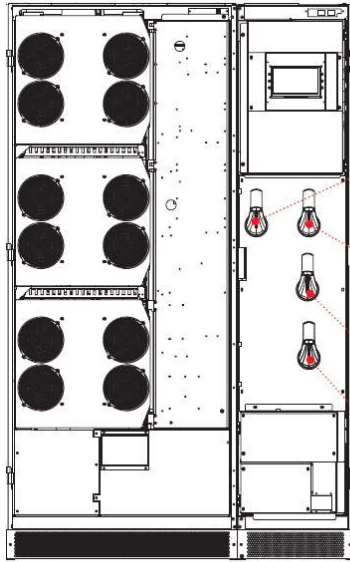
More and more applications require the use of lithium batteries that are always paired with Battery Monitoring Systems: for this reason, **S500** series offers an advanced interfacing system to easily dialogue with this kind of systems.

DETAILS

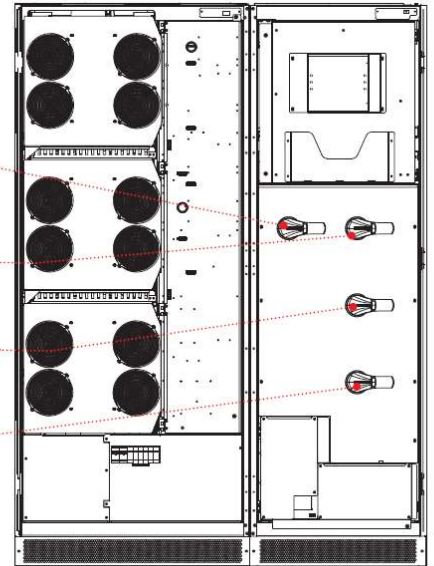
**S500-250
(Open front)**



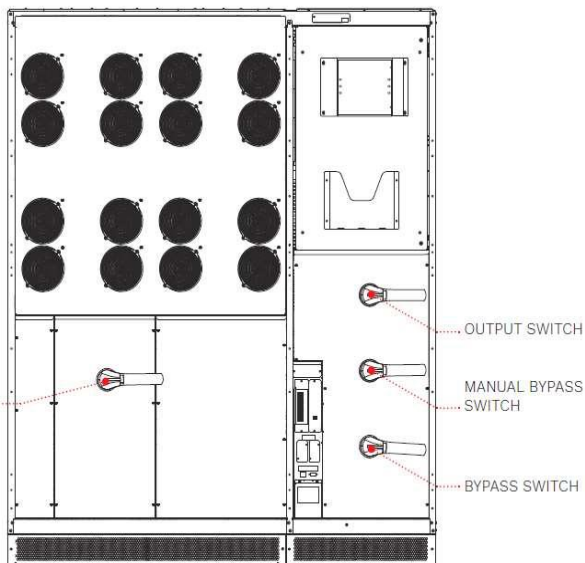
**S500-350
(Open front)**



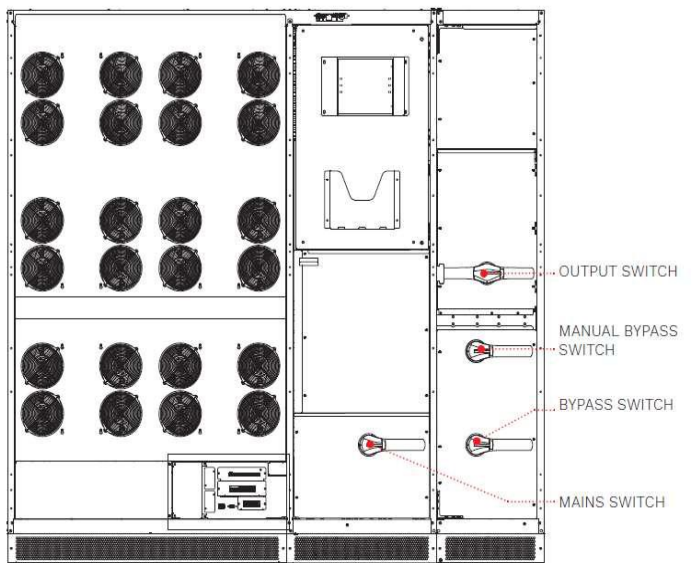
**S500-400
(Open front)**



**S500-500
(Open front)**



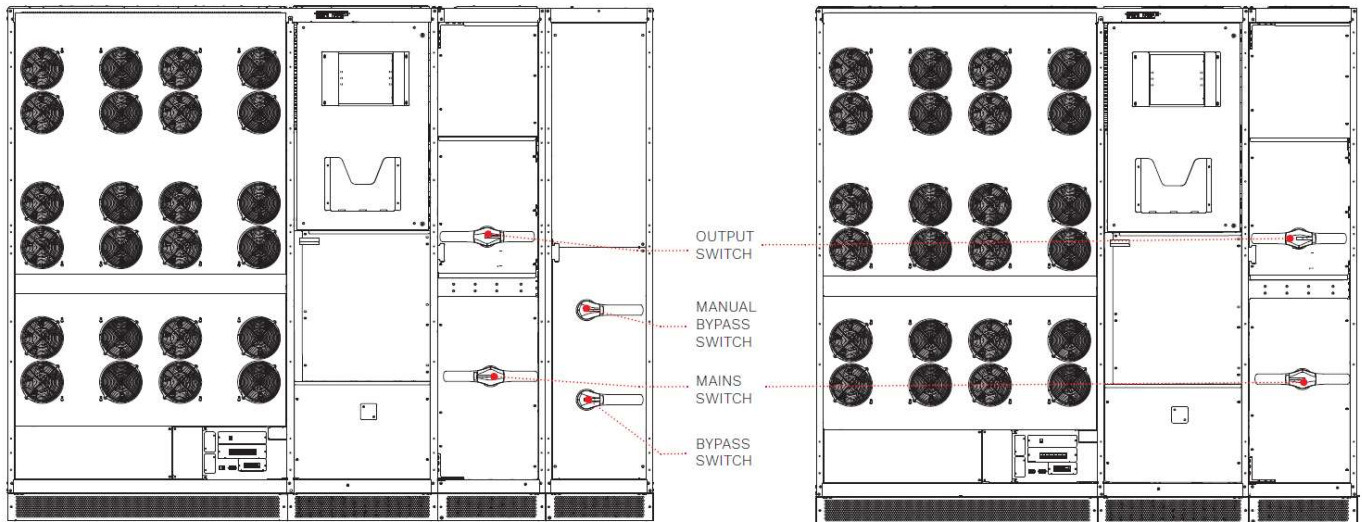
**S500-600
(Open front)**



DETAILS

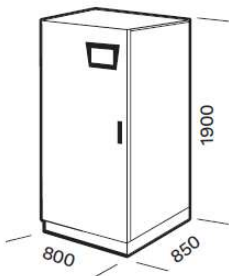
**S500-800
(Open front)**

**S500-800 2SW
(Open front)**

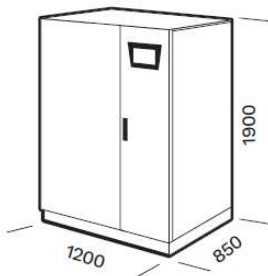


DIMENSION

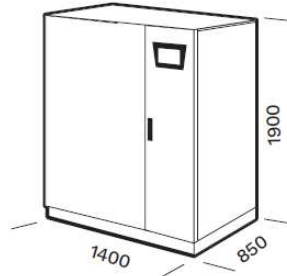
S500-250



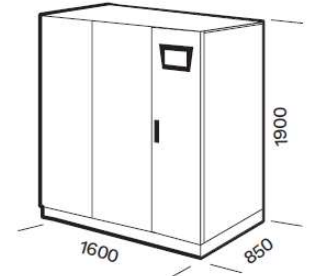
S500-300



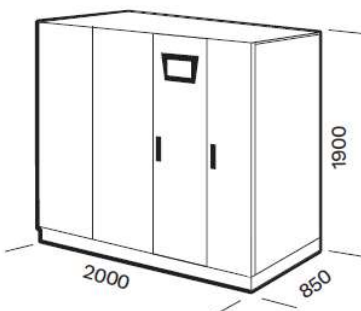
S500-400



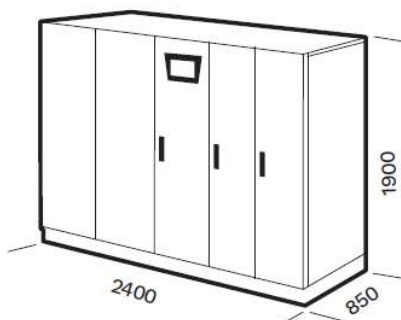
S500-500



S500-600



S500-800



OPTIONS

SOFTWARE	MULTI I/P	Cold start
PowerShield3	MULTI PANEL	Air filter kit
PowerNetguard	PRODUCT ACCESSORIES	ENERGYMANAGER
ACCESSORIES	Battery temperature sensor	
NETMAN 208	Isolation transformer	
MULTICOM 302	Parallel kit	
MULTICOM 352	Synchronisation device (UGS)	
MULTICOM 411	Hot connection device (PSJ)	
MULTICOM 421	IP21/IP31 versions, other on request	

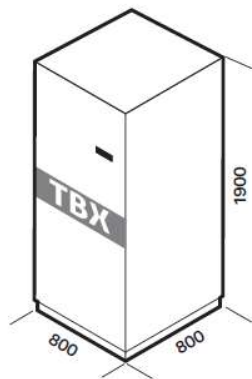
BATTERY CABINET

MODELS	BTC 1900 480V BB V6 3T BTC 1900 480V BB V7 3T BTC 1900 480V BB V8 3T BTC 1900 480V BB V9 3T
UPS MODELS	S500 (250-300-400-500-600-800)

THREE-PHASE ISOLATION TRANSFORMERS

MODELS TBX ISO 250 T Dzn0

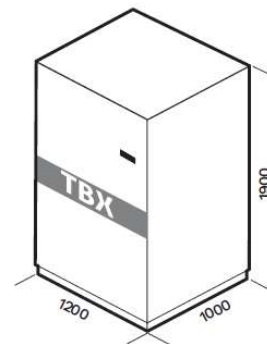
UPS MODELS S500-250



TBX ISO 300 T Dzn0

TBX ISO 600 T Dzn0

S500 300-400-500-600



Note: TBX ISO 800 T Dzn0 for NXE 800 available on request.

S500 Technical Specifications 250-300-400kVA

MODELS	S500-250	S500-300	S500-400
INPUT			
Rated voltage [V]	380 / 400 / 415 three-phase		
Voltage tolerance [V]	400 ±20% @ full load ¹		
Frequency tolerance [Hz]	40 - 70		
Power factor	0.99		
THDI	<3%		
Soft Start	0 - 100% in 120 s (selectable)		
Standard equipment provided	Back-feed protection, separate bypass line		
BATTERIES			
Type	VRLA AGM / GEL, NiCd, Super-caps, Li-ion		
Ripple current	Zero		
Recharge voltage compensation	-0.11% x V x °C		
OUTPUT			
Nominal Power [kVA]	250	300	400
Active Power [kW]	250	300	400
Number of phases	3 + N		
Rated voltage [V]	380 / 400 / 415 three-phase + N (selectable)		
Static Stability	±1%		
Dynamic Stability	±5% in 10 ms		
Voltage distortion	<1% with linear load/<3% with non-linear load		
Frequency stability on battery	± 0.05%		
Frequency [Hz]	50 or 60 (selectable)		
Overload	110% for 60 min; 125% for 2 min; 150% for 20 s	110% for 60 min; 125% for 10 min; 150% for 1 min	
BYPASS			
Rated voltage [V]	380 / 400 / 415 three-phase + N		
Rated Frequency [Hz]	50 or 60 (selectable)		
Frequency tolerance	±2% (selectable from ±1% to ±5%)		
OVERALL SPECIFICATIONS			
Weight [kg]	634	880	1100
Dimension (WxDxH) [mm]	800x850x1900	1200x850x1900	1400x850x1900
Input cable	Bottom	Top and bottom	Top and bottom
Remote signals	Volt-free contact (configurable)		
Remote controls	EPO, bypass battery charge block (configurable)		
Communications	USB + Dry contacts + 2 slots for communications interface		
Ambient temperature for the UPS	0 °C - +40 °C		
Recommended temperature for battery life	+20 °C - +25 °C		
Range of relative humidity	5-95% non-condensing		
Colour	RAL 7016		
IP rating	IP20 (other on request)		
Efficiency (AC-AC) ONLINE Mode	up to 97%		
Standards	European directives: LV 2014/35/EU low voltage Directive EMC 2014/30/EU electromagnetic compatibility Directive Standards: Safety IEC EN 62040-1; EMC IEC EN 62040-2; RoHS compliant Classification in accordance with IEC 62040-3 (Voltage frequency Independent) VFI - SS - 111		
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111		
Moving the UPS	Pallet jack		

1 For wider tolerance conditions apply.

S500 Technical Specifications 500-600-800 2SW-800kVA

MODELS	S500-500	S500-600	S500-800 2SW	S500-800
INPUT				
Rated voltage [V]	380 / 400 / 415 three-phase			
Voltage tolerance [V]	400 ±20% @ full load ¹			
Frequency tolerance [Hz]	40 - 70			
Power factor	0.99			
THDI	<3%			
Soft Start	0 - 100% in 120 s (selectable)			
Standard equipment provided	Back-feed protection, separate bypass line			
BATTERIES				
Type	VRLA AGM / GEL, NiCd, Super-caps, Li-ion			
Ripple current	Zero			
Recharge voltage compensation	-0.11% x V x °C			
OUTPUT				
Nominal Power [kVA]	500	600	800	800
Active Power [kW]	500	600	800	800
Number of phases	3 + N			
Rated voltage [V]	380 / 400 / 415 three-phase + N (selectable)			
Static Stability	±1%			
Dynamic Stability	±5% in 10 ms			
Voltage distortion	<1% with linear load/<3% with non-linear load			
Frequency stability on battery	± 0.05%			
Frequency [Hz]	50 or 60 (selectable)			
Overload	110% for 60 min; 125% for 2 min; 150% for 20 s	110% for 60 min; 125% for 10 min; 150% for 1 min		
BYPASS				
Rated voltage [V]	380 / 400 / 415 three-phase + N			
Rated Frequency [Hz]	50 or 60 (selectable)			
Frequency tolerance	±2% (selectable from ±1% to ±5%)			
OVERALL SPECIFICATIONS				
Weight [kg]	1300	1600	1800	1985
Dimension (WxDxH) [mm]	1600x850x1900	2000x850x1900	2000x850x1900	2400x850x1900
Input cable	Bottom	Bottom	Bottom	Top and bottom
Remote signals	Volt-free contact (configurable)			
Remote controls	EPO, bypass battery charge block (configurable)			
Communications	USB + Dry contacts + 2 slots for communications interface			
Ambient temperature for the UPS	0 °C - +40 °C			
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Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111			
Moving the UPS	Pallet jack			

¹ For wider tolerance conditions apply.



SATRON Power Solutions
Approach your local SATRON Power Solutions representative for further support.
Contact details can be found on:
www.satronpower.com