

Basics for need of BESS (Battery Energy Storage System)

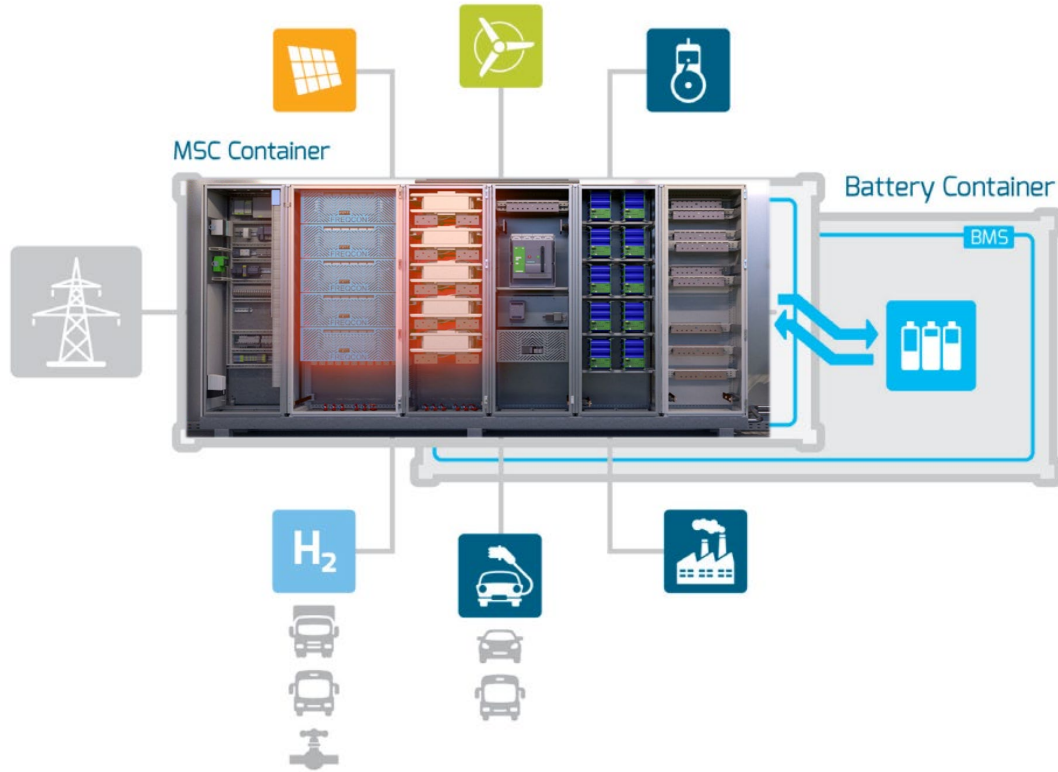


To handle fluctuating loads and sources



To buffer high loads

BESS – principle



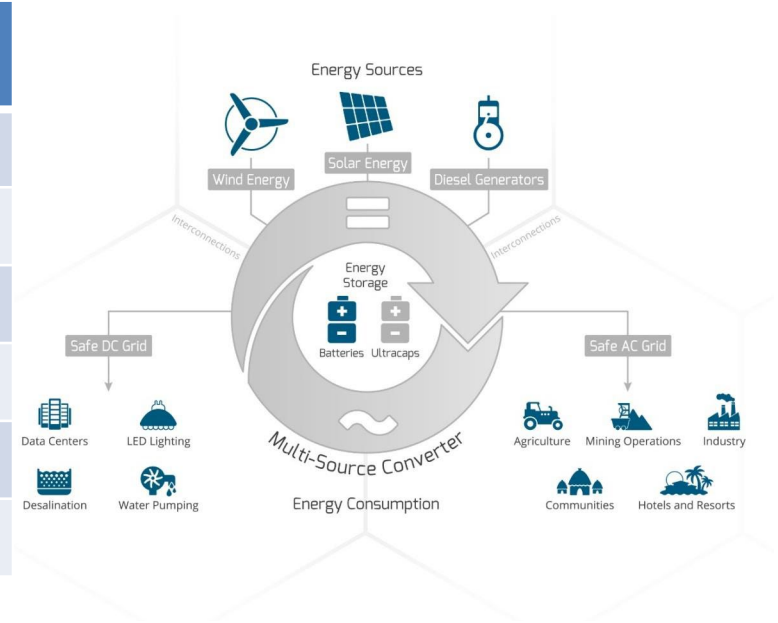
BESS – advantages

- Multi Source Converters 150 kW to 2 MW, scalable to > 100 MW
- Hybrid converter for integration of various energy sources/consumers
- Subsequent integration of further energy sources and consumers very easy
- Flexible energy storage solution with batteries and/or ultracapacitors
- Compliance with all required grid codes
- Compact, modular solution in an ISO container
- Charging and discharging rates of 0.25 C to 20 C



BESS – Examples footprint for systems 1h backup

Power MW	Capacity MWh	Container Converter	Container Battery
0.5	0.68	1 x 20 ft.	
1.0	1.13	1 x 30 ft.	
1.5	1.58	1 x 30 ft.	
2.0	2.03	1 x 30 ft.	
3.0	3.39	1 x 20 ft.	1 x 30 ft.
4.5	4.74	1 x 20 ft.	1 x 40 ft.



Emost – a mobile UPS or mobile BESS



First mobile UPS or mobile storage system

Basic need for mobile BESS



Avoid high costs for larger installation



Avoid costs and delays for crossing of streets



Avoid noise and dust from Diesel engines

Advantages of mobile BESS

1



ECOLOGIC:

- Ecologic: Fulfills all regulatory norms – now and in a CO2 free world.
- With no emissions, the emost Butler is ideal also for closed quarters.

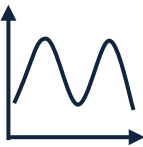
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QUIET:

- Leads to increased comfort, health & safety and enables nighttime construction.

3



HIGH ENERGY QUALITY:

- Generates high quality power under minimum loads as well as under full load.
- Thus allows the use of sensitive equipment.

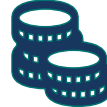
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EASY TO USE:

- Permit-free and simple installation for rapid site mobilization.
- Trouble-free transport and easy operation.
- Robust design for industrial use.

5



ECONOMIC:

- Better price-performance ratio than with diesel generators and complex time-limited network connections
- Eliminates the 20% minimum load and/or power oversizing.

6



TRANSPARENCY:

- Professional monitoring and control by an integrated service platform (IoT platform)
- Possibility for the digitalization of existing processes.

Applications of mobile BESS



TEMPORARY BUILDINGS



CONSTRUCTION



powered by **STATRON**
NON STOP POWER



STANDBY POWER



EMERGENCY SERVICES



TRANSPORT



EVENTS

Applications of mobile BESS

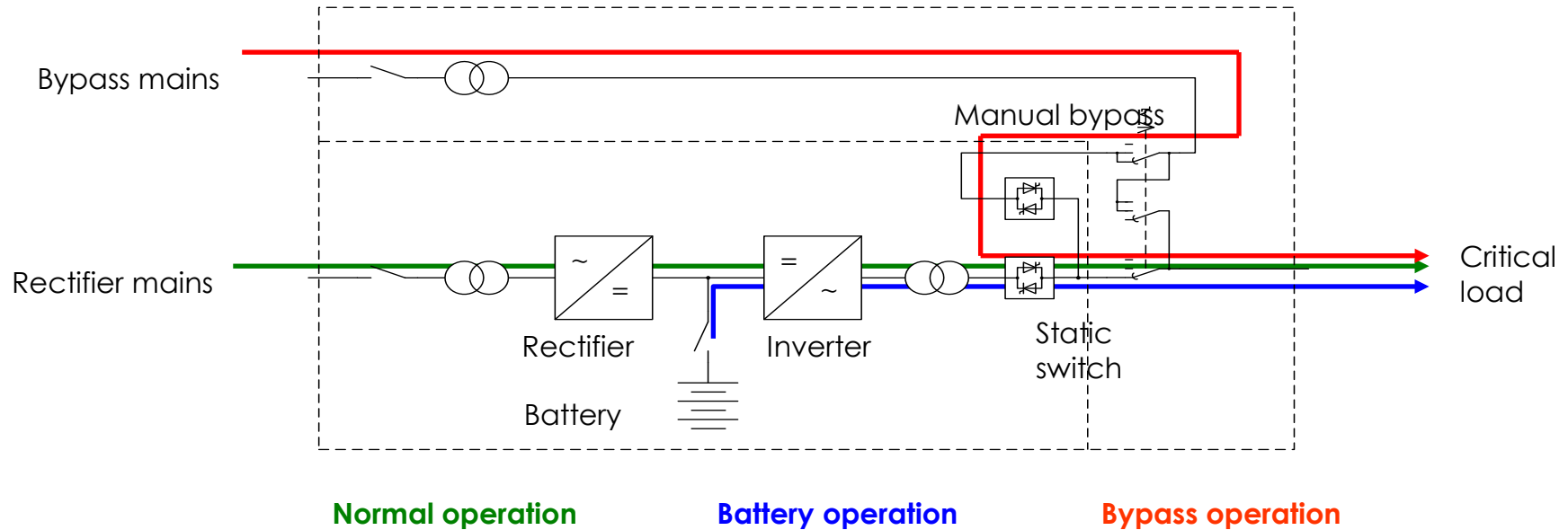


- Lithium-Ion technology
- Peak power 75 kVA
- Nominal power 50 kVA
- Capacity 25 kWh
- Charging: 3-p, 400VAC, 16 or 32 A plug; optional 1-p 220V type 13 plug
- Discharge:
 - CEE 400 VAC 32 A plug
 - CEE 400 VAC 16 A plug
 - Type 25 1-p, 230 VAC
 - Optional CEE 400 VAC 63 A plug
- Dimensions: 0.8 m x 1.5 m x 1.1 m
- Weight: approx. 650 kg



Industrial UPS

UPS topology online UPS with double conversion



Industrial UPS: Construction



Cabinet: Robust, self-contained steel frame, meeting the specified IP-degree, allowance for air filters

Material: Corrosion-proof components and connections

Layout: Good accessibility and operability, clear and permanent component identification

Wiring: Non-halogenated wiring insulation with a high temperature degree

Industrial UPS: Design criteria



Accessibility:

Quick and safe accessibility in case of failures or maintenance activities,
Low MTTR due to easy front access

Replaceability:

Simple replacement of modules/
assemblies (almost) without

**Fans:
Redundancy:**

N+1 or 100% redundant fans in case natural
cooling is not adequate

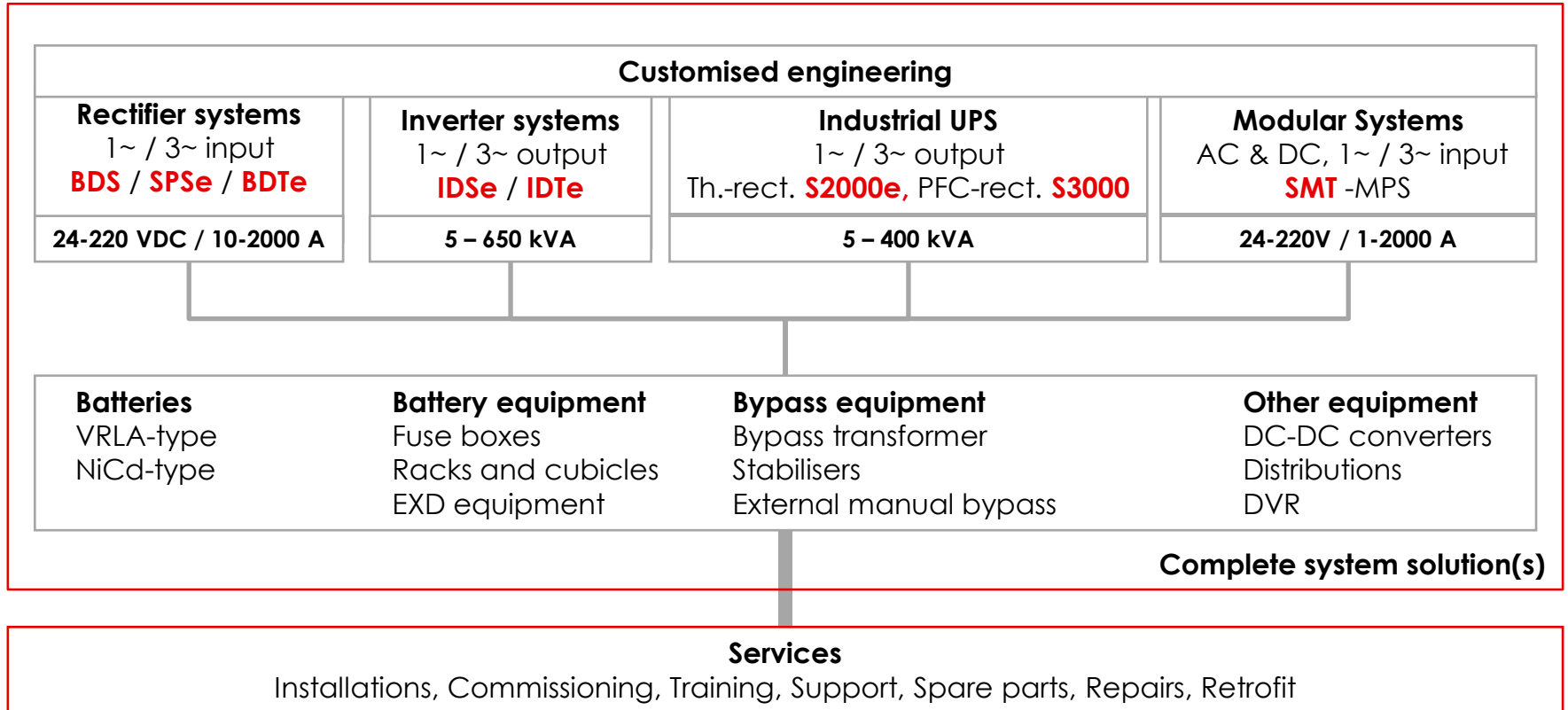
Replacement:

Safe replacement without disturbing the
load

Lifetime:

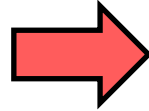
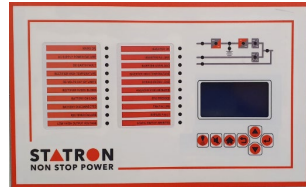
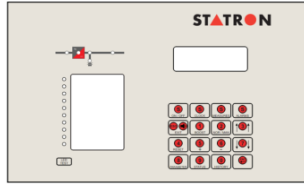
Extended replacement intervals

Product portfolio “Industrial”

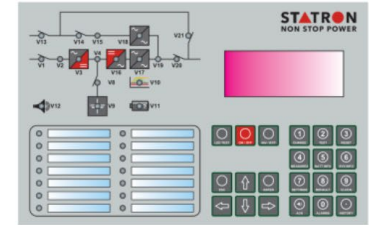
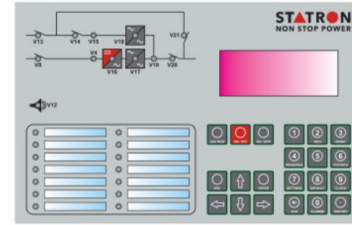
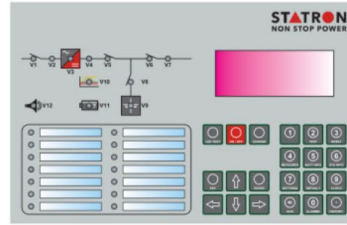


Display improvements – Statron UHMI concept

Former HMI



Improved Universal HMI concept



- Membrane foil panel
- Representation of actual block diagram
- Multicolour-LED's / Programmable alarms
- Comprehensive sealed keypad
- 192x64 dot / 8 lines LCD with backlight
- Real time Event Recorder (2500 entries)
- Multi-language support
- 12 programmable alarms / indications
- Multi-level user management
- Universal HMI for all Statron industrial products

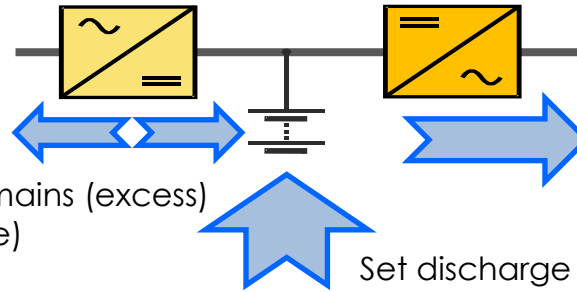
S3000: Unique feature battery mgmt. with integrated battery discharger



- Constant current battery discharge test by means of sinusoidal mains back-feed
- Battery monitoring with programmed discharge data
- Periodic automated battery availability check
- Real time battery capacity and back-up time display
- Three voltage levels / two current limitation steps
- Temperature compensation

Illustration of automatically managed constant current battery discharge test

Balance energy fed back to mains (excess) or drawn from mains (shortage)



Actual power demand from connected UPS AC loads

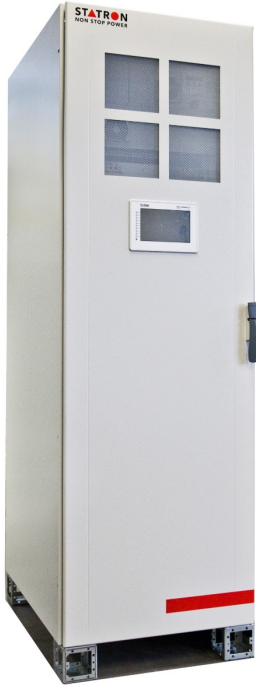
Set discharge current (e.g. I_5) kept constant throughout test cycle

SMT – Statron Modular Technology



- 24, 48, 110, 220 VDC modules
- 1 kW to 3 kW modules (typ. 3 kW)
- Hot swappable
- uP controlled
- Very low input THDi < 4%
- Galvanic isolated output

SMT: Main features and advantages



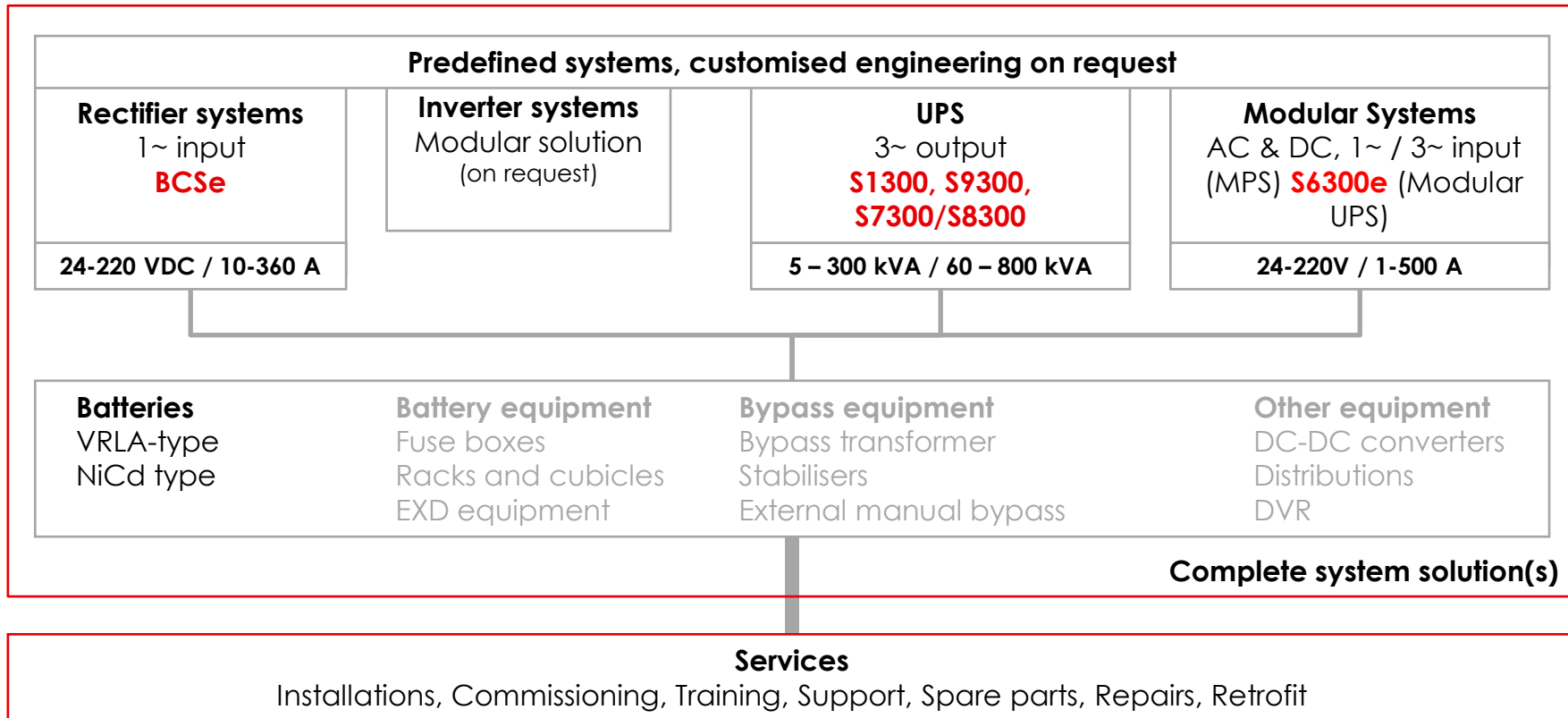
- For NiCd and lead acid batteries
- Automatic and manual boost charge with interlocking
- 2 x 100% and n + 1 solutions
- Modern touch display for status, metering and alarms
- Modbus / TCP/IP Interface, RS485 / SNMP
- Event history
- Total system solutions





Semi-Industrial / Commercial UPS

Product portfolio “Semi-Industrial / Commercial UPS”



BCSe: THE small, reliable and cost-effective battery charger



- Based on well proven technology
- Power factor corrected rectifier (PF 0,99)
- Simple to use, easy to adjust
- Clear structured front panel
- High efficiency
- Very low ripple voltage
- 2-level charging for NiCd and Lead Acid batteries
- Design life of up to 20 years
- Economic price
- Different voltage levels available
- Different sizes available
- Battery inside available

S1300: Well established semi-industrial UPS



- Double conversion online UPS with high efficiency (up to 96%) and compact construction
- High efficiency thanks to Power Efficiency Mode (PEM)
- Output designed for PF 1.0 loading
- Power factor corrected rectifier (PFC), PF 0.99, THDi < 3 %
- Dynamic Charge Mode (DCM) reduces battery recharge time
- Advanced Battery Care (ABC) extends battery lifetime
- Power transformer free UPS design leads to low weight and high efficiency
- Large touchscreen, easy operation and monitoring
- Comprehensive set of communication options for flexible remote monitoring
- Same handling and spare parts over full power range
- Modern LCD HMI

S6300e: Reliable modular UPS: 20 – 60 kVA



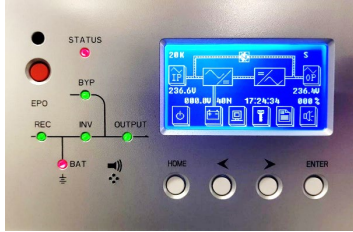
- Compact design, small dimensions, 60 kVA with ~6 min. autonomy on 0,61 m²
- Power factor correction PF > 0,99
- Power module 20 kVA / 18 kW
- Max. 3 modules (60 kVA or 40 kVA N+1) in standard cabinet
- Built in batteries, Nominal +/-240 VDC
- Intelligent charging management
- Battery cold start
- Smart sleep function – shutdown of power modules to increase system efficiency
- Multi communication interface (RS232, RS485, USB, SNMP, AS400 and programmable dry contacts)

S6300e: Reliable modular UPS: 50 – 500 kVA



- Compact design, small dimensions 500 kVA on 1,45 m²
- Power factor correction PF > 0,99
- Power module 50 kVA/45 kW
- 4 different cabinet sizes (100, 200, 300, 500 kVA)
- High scalability 50 – 500 kVA in one cabinet, 3 units in parallel up to 1500 kVA
- Redundancy N+x
- Nominal battery voltage +/-240 VDC (2x20 blocks VRLA)
- Intelligent charging management
- Battery cold start
- Smart sleep function – shutdown of power modules to increase system efficiency
- Multi communication interface (RS232, RS485, USB, SNMP, AS400 and programmable dry contacts)

S9300: Reliable semi-industrial UPS for small ratings



- Compact design, small dimensions
- Power factor correction PF >0,99
- Built in batteries, Nominal +/-240VDC
- Optional with external batteries
- Can be used as „replacement“ for S4100 UPS (32 Blocks 12V) with some limitations
- Float and Boost charge level
- High resolution LCD screen
- 8 different temperature sensors inside UPS
- 4 circuit breakers (Input, Output, Bypass, Battery)
- Internal manual Bypass
- Cable entry backside
- Transportation wheels
- Short circuit current $3 \times I_{nom} / 200ms$
- No galvanic isolation input & output !!!

S7300/8300: Reliable semi-industrial UPS for high ratings

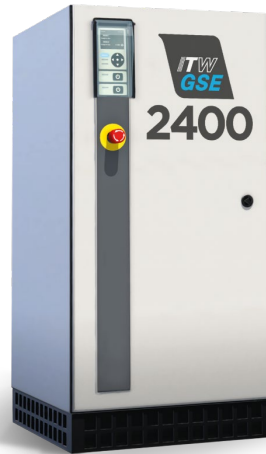


- Online double conversion UPS with high efficiency
- Large power range 60 – 300 kVA or 400 – 800 kVA
- Input power factor < 0.99
- Inverter output isolation transformer
- User friendly LCD Display
- Automatic and manual battery test
- Service access from the front and top
- Dynamic charge mode (DCM) that allows fast recharge of battery in partial load operation
- High track record in tunnel-applications



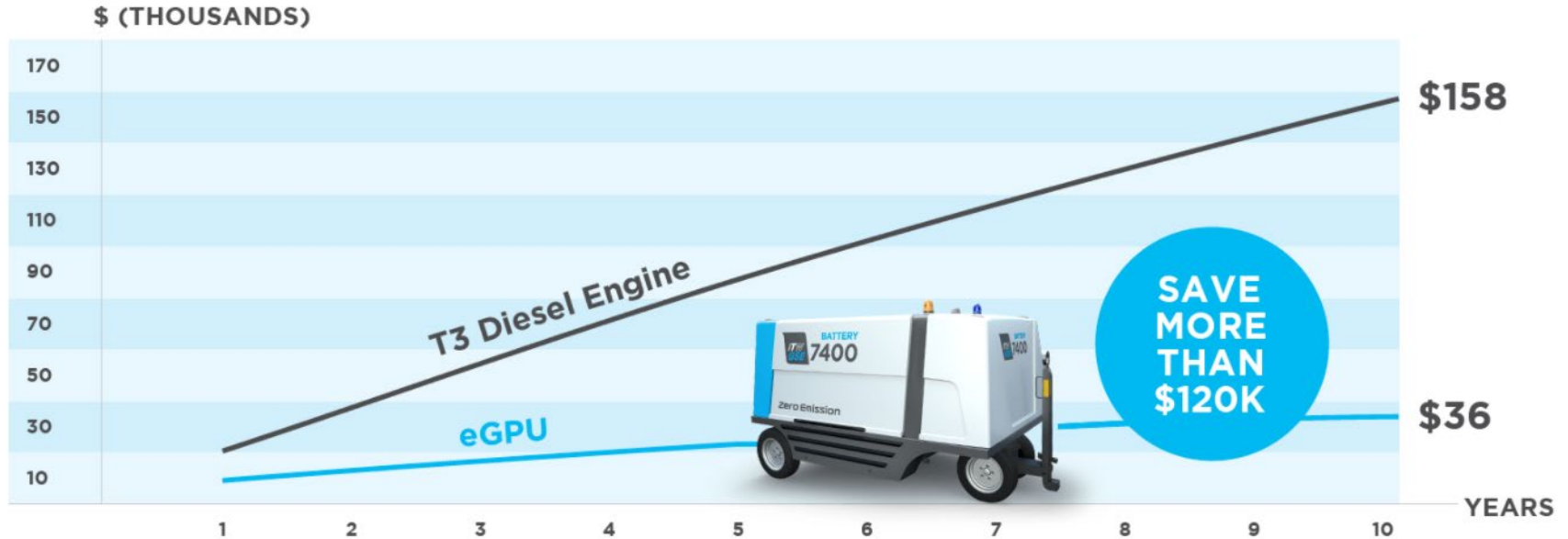
Aviation

Reliable and innovative ground power units (GPU)



- Mobile and fix-installed
- Fits for every airport
- Fits for every heli-port

Go green with first full-electric GPU 7400

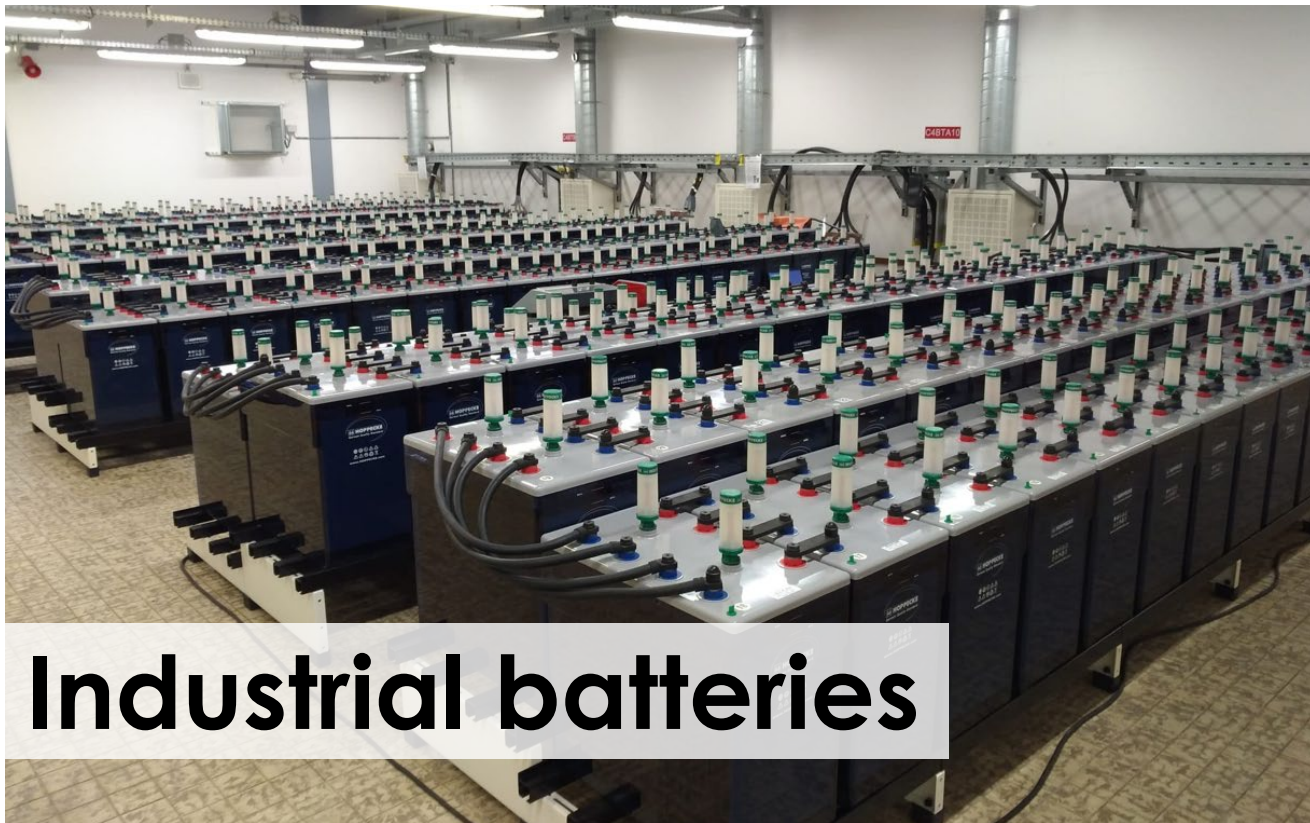


- First unit sold from Statron
- Saves costs and emissions
- Extremely low noise

Reliable and innovative pre-conditioned air (PCA) units



- Innovative products
- Intelligent power management



Industrial batteries

Industrial batteries



- All systems require secure energy storage
- STATRON collaborates with renowned manufacturers of industrial batteries
- Allows our engineers to choose the best battery from a complete range of technologies suitable for every application, such as:
 - **Maintenance free valve regulated lead acid batteries**
 - **Low maintenance vented lead acid batteries**
 - **Nickel cadmium batteries**
 - **Li-Ion battery systems**



Batteries: Lead acid maintenance free valve regulated



- Flat and tubular plates
- AGM and Gel technologies
- Single cells, 6V / 12V Blocks
- Front terminal versions



Batteries: Vented lead acid low maintenance



- Tubular plate
- Flat plate
- GroE plate



Batteries: NiCd



- Pocket plate: technology offering best mechanical strength
- Sintered plate: technology for maximum power to volume ratio
- Plastic-bonded plate: technology for high performance with very long cycle life





Services

After Sales Services portfolio



Consulting

Approval

Testing

Delivery

Engineering

Assembly

FAT

Commissioning

STATRON Service Support

After Sales Service

- 7 Service Engineers
- 4 Site service
- 2 In house testing
- 1 Troubleshooting
- 1 Sales & planning
- 1 Training & Support

Service

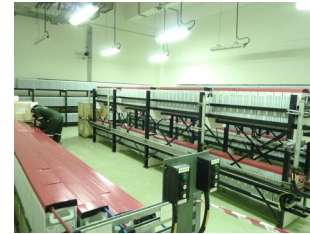
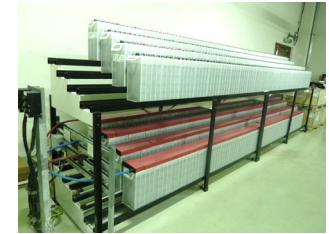
- Installation (sub con)
- Testing & Commissioning
- Maintenance
- Troubleshooting (24 hrs)
- Retrofitting
- Repairing 24/7

Support

- Spare parts (stock)
- Class / Online training
- Site training
- Load bank (AC&DC)
- Rental systems (AC&DC)
- Batteries & BMS
- Lighting



STATRON TNB & Petronas Site Installation



STATRON-LRT3 Installation – 29 locations



Total: 58 Chargers

Installation at 26 stations +
3 Depot with Saft Nickel
Cadmium batteries



STATRON-Retrofit Charger for Larut-A Platform

Installation of 9 Retrofit
chargers at platform E-POMS



STATRON-Wiener Linien, Austria



WIENER LINIEN

300 Panels

150 units of parallel redundant systems
With SAFT Nickel Cadmium batteries



Conclusion

We can execute your projects ... what ever it might be!



Motto 2022: Grow and look for attractive opportunities

