

Technical Catalog

## Switched Rectifier / Charger TPS125



**Peace of mind  
in critical missions.**

- High-frequency switched rectification
- Modular hot-swap for high availability
- High Power Factor and Low Harmonic Distortion
- User-friendly and intuitive Human-Machine Interface
- 100% National Technology

## FEATURES

---

**The Tekpower TPS125 combines modular high-frequency architecture with proven reliability, delivering superior performance in critical power applications.**

- Hot-swappable rectifier modules, ensuring maintenance without interruption
- Scalable expansion up to 32 modules in parallel, increasing capacity according to demand
- High efficiency (92% typical) and low ripple (<1%), ensuring clean and stable energy
- Configurable alarms with user-adjustable timing
- Advanced current control of rectifier and battery
- Comprehensive protections against short-circuit, input/output overvoltage, phase loss, overtemperature and frequency deviations
- Integrated battery test, with measurement of autonomy, capacity in Ah and energy in kWh
- Automatic voltage compensation according to temperature (up to 8 optional sensors)



- Automatic and manual charging modes (float and equalization), with programmable timing
- Operation hours logging and recharge cycle counter for preventive maintenance
- Active power factor correction (PF > 0.99), reducing reactive currents and ensuring efficiency at full load
- Wide AC input range, reliable in unstable grids or generator sets
- Compatibility with multiple communication protocols (DNP3, MODBUS TCP, IEC61850, etc.) via proprietary gateway
- Gradual startup and dynamic compensation of supply frequency oscillations, ensuring compatibility with small generator sets
- Fast dynamic response to load steps
- Detection and protection against cyclic recurrence of AC input failures: extended lifespan even in highly intermittent grids
- Hot-swap operation available on rectifier modules, allowing replacement without interruption
- Inrush current limiter device in AC input with disconnection contactor (optional)
- UQD (Drop Diode Unit), offering redundancy, scalability and hot-swappable operation under conditions of DC voltage supplied to loads (optional)



Scan the  
QR code to  
learn more!



# Purposes and Applications

The TekSea TekPower TPS125 Rectifier/Charger is a high-frequency switched system designed with modular architecture. It consists of electronic equipment essentially formed by a static converter, primarily designed to supply DC loads, ensuring high efficiency, reliability and electronic control.

Compatible with stationary, automotive, lead-acid, alkaline or lithium batteries, its versatility allows flexible application. In addition to charging, it can power DC loads simultaneously, ensuring continuity in critical applications. When supplied together with a battery bank, it functions as an Uninterruptible DC Power System, but its main function remains charging the accumulators.

With hot-swappable modules, the TPS125 allows expansion and maintenance without interruption. It features high static regulation and precision, low ripple, typical efficiency of 92% and advanced protection and redundancy features, ensuring stable and reliable performance in critical missions.



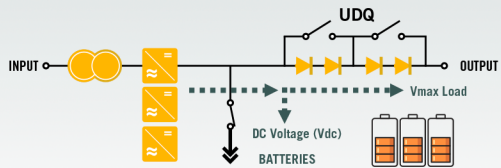
# Technological Differentials



## Performance and Reliability

Modular high-frequency architecture ensures low ripple, high efficiency and reliability.

Reliable operation even in low-quality grids, tolerating harmonic distortions, voltage variations and frequency deviations, including critical conditions with generator sets.



## UQD – Drop Diode Unit

Multi-stage technology that reduces the number of contactors, improves output voltage regulation and uses hysteresis strategy to avoid switching oscillations, with cases of diode overheating automatically bypassed.

This solution increases system operational reliability and ensures continuity of energy in mission-critical applications.



## Compatibility with Multiple Battery Technologies

Flexibility to operate with different battery types, including lead-acid, VRLA, Ni-Cd and lithium.

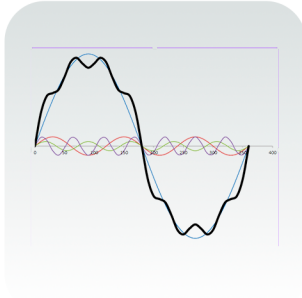
Allows adaptation to different projects and operating requirements, ensuring versatility in mission-critical industrial applications.

# Technological Differentials



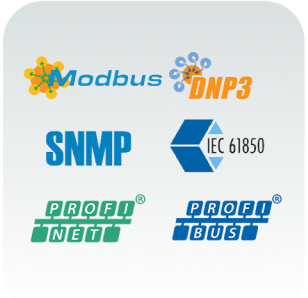
## Short-Circuit Protection

Thanks to its modular high-frequency architecture, the Tekpower TPS125 supports DC short-circuit currents at its output, ensuring operator safety and equipment protection even under extremely adverse conditions.



## Support for High Harmonic Distortion Levels

Designed to operate in grids with high harmonic distortion levels, ensuring robust and stable operation. Ideal for industrial applications operating with generator sets.



## Integration with Supervision Systems

### Available protocols:

- ✓ Modbus RTU
- ✓ Modbus TCP
- ✓ DNP3
- ✓ SNMP v1, v2c and v3
- ✓ MMS IEC61850
- ✓ Profibus
- ✓ Profinet



# Technological Differentials



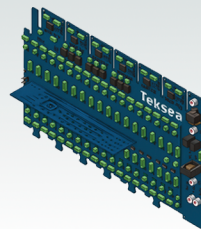
## Human-Machine Interface (HMI)

Equipped with 128 x 64 pixel graphical HMI, providing visualization of electrical variables and system status. Enables full operation and configuration of the system, ensuring traceability and ease of diagnostics.



## Electrical Protection and Complete Isolation

Rectifier modules feature total isolation between stages, ensuring protection against disturbances in the grid and operational continuity.



## Digital Control on Proprietary Platform

Control fully implemented in DSP (Digital Signal Processor), using a proprietary platform that allows high precision, flexibility and future expansions.

06-2025



## 100% National Technology

TekSea invests in national technology as a strategic pillar, with solutions developed by engineers, masters and PhDs, strengthening innovation and technological advancement in the Brazilian industry.

# TSU125 – Rectifier Unit of TPS125 System



06-2025

The TSU125 is the rectifier module that composes the TPS125 Rectifier/Charger. Designed in high frequency, it offers reliability and superior performance for critical applications.

#### Main Features:

- Nominal power of 2.9 kW and output current of up to 22 A
- Hot-swappable architecture, allowing replacement without shutting down the system
- Front interface with digital display, navigation keys and LEDs for status, alarm and fault
- Parallel control, ensuring voltage and current accuracy
- Parallel operation of up to 32 modules, ensuring scalability and n+1 redundancy

The TSU125 integrates electronic protections, automatic current sharing between modules, high efficiency and ripple <1%.

Even under severe conditions, it maintains stable operation due to thermal derating and hot-swap concept, ensuring high system availability.

# Advanced Features of Tekpower TPS

## Asymmetrical Multi-stage UQD

The Drop Diode Unit (UQD) ensures that voltage supplied to loads remains within safe limits, even when banks operate in different charge states.

Exclusive TekSea technology provides:

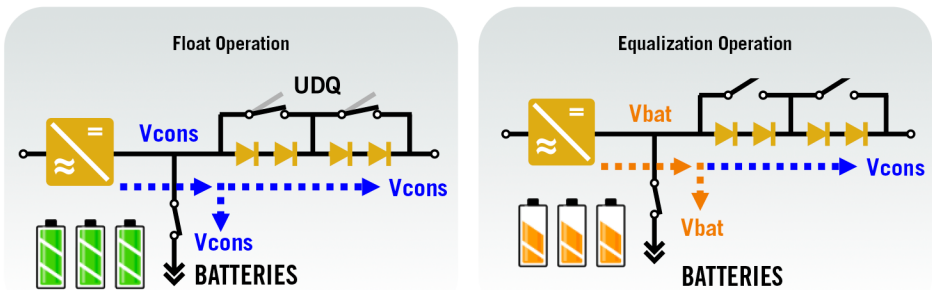
**Reduction in the number of contactors and increase in regulation stages**, according to system requirements

**Hysteresis strategy** to prevent contactor oscillations and extend system lifespan

**Protection against contactor failures**, ensuring operational continuity

**Intelligent emergency mode** that performs automatic UQD bypass in case of diode overtemperature, maintaining a stable and safe output voltage even under critical conditions.

06-2025



# Advanced Features of Tekpower TPS

## Integrated Battery Test

The Tekpower TPS incorporates an exclusive battery test function that enables accurate evaluation of the capacity and autonomy of the battery bank, reducing operational risks and ensuring reliability in emergency situations.

### Mode with Active Current Control

Maintains a constant discharge current, as set in the rectifier

Ideal for standardized tests according to the manufacturer's specifications

Accurate evaluation of capacity (Ah) and autonomy (min)

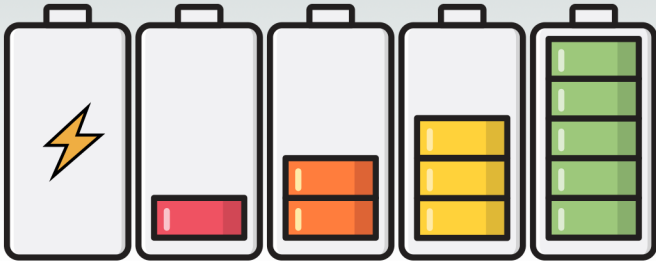
### External Load Discharge Mode

Accurate evaluation of battery autonomy and actual capacity

Verification of dynamic behavior during discharge

Allows assessment of real capacity and autonomy under actual operating

This integrated functionality turns the Tekpower TPS into a comprehensive preventive diagnostic tool, avoiding unexpected issues in the field and optimizing battery bank management.



# Advanced Features of Tekpower TPS

## HOT-SWAPPABLE ARCHITECTURE

The TPS125 system was designed to maintain continuous operation in mission-critical environments. Each rectifier module is hot-swappable, allowing its replacement or insertion while the system is energized, without the need to shut down the equipment or interrupt power supply to the loads. All modules operate actively in parallel, ensuring optimal use of installed power and n+1 redundancy.

### Main Hot-Swap features in TPS125:

- **Safe replacement:** each module has its own circuit breaker and individual protections, ensuring electrical isolation during removal
- **Guaranteed continuity:** the remaining modules automatically assume the current share of the removed module
- **Automatic reinsertion:** when a new module is inserted, it is synchronized with the DC bus and begins sharing the load
- **Reduced operational costs:** maintenance without extended scheduled downtime
- **Scalability:** capacity expansion simply by adding new modules

06-2025



0.00959

**HOT SWAP**

# Recursos Avançados do Tekpower TPS

## PARALLEL CONFIGURATION

The Tekpower TPS was designed to operate reliably in parallel with other rectifiers, increasing current capacity and providing greater flexibility for system expansion.

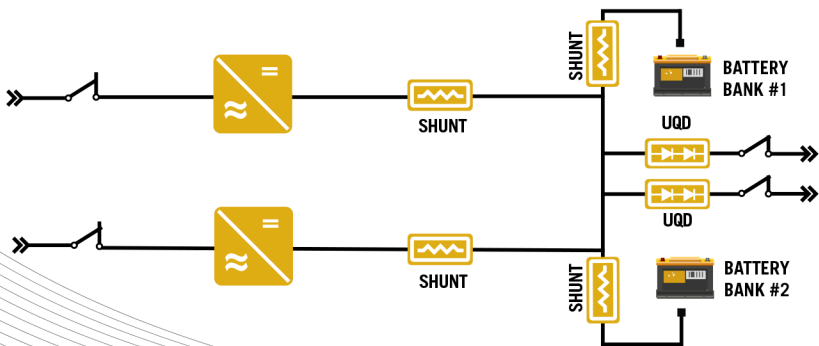
This configuration can be supplied with a blocking diode, which ensures:

- ✓ Correct charging of the battery bank, preventing undesired current circulation between rectifiers
- ✓ Balanced load sharing, preserving equipment lifespan and ensuring stability on the DC bus
- ✓ Additional safety in critical applications, preventing current backfeed in case of failure of one of the rectifiers

Parallel operation enables everything from simple capacity expansion to the implementation of n+1 redundant architectures, making the Tekpower TPS a robust and scalable solution for mission-critical DC power systems.

06-2025

## REDUNDANT RECTIFIERS



# Advanced Features of Tekpower TPS

## UQC – Drop Converter Unit (Optional)

The UQC (Drop Converter Unit) is an optional module of the TPS125 designed to condition and stabilize the DC voltage supplied to DC loads. It operates together with the rectifier and the battery, ensuring greater reliability and system stability.

## MAIN FEATURES OF THE UQC:

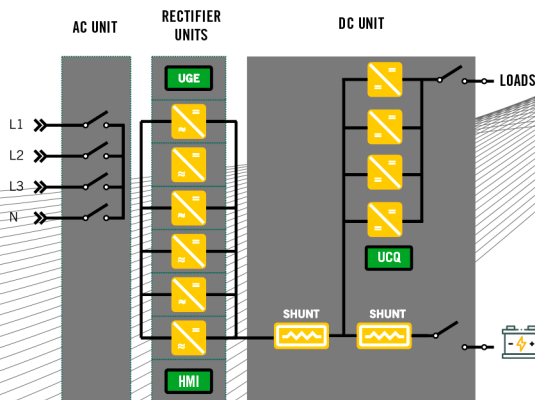
- **Modular architecture:** based on high-frequency converters
- **Parallel operation:** balanced load sharing
- **n+1 redundancy:** continuity even in case of module failure
- **Hot-swappable:** module replacement without shutting down the system
- **Full integration:** Modbus RS-485 communication with supervision via HMI
- **Flexibility:** DC input (105–150 Vdc), with output adjustment between 91 and 145 Vdc

06-2025

## HOW IT WORKS IN THE SYSTEM:

Installed after the rectification stage, the UQC provides an additional stabilization layer, ensuring that the output voltage remains within defined limits, even under adverse grid conditions.

The modular concept allows maintenance without downtime, capacity expansion, and reliable operation in critical applications.



## Technical Specifications

<b>General Data</b>	Power Range	Up to 96 kW
	Topology	High Frequency Switched
	Technology	Modular
	Isolation	Full high-frequency isolation
	Compliance with:	IEC 55032; IEC 55035; IEC 61000-3-2; IEC 61000-3-3; IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4; IEC 61000-4-5; IEC 61000-4-6; IEC 61000-4-8; IEC 61000-4-11; EN61000-6
<b>AC Input</b>	System	1F / 2F / 3F / 3F + N
	Nominal Voltage	220 / 380 V *
	Nominal Frequency	50 / 60 Hz *
	Frequency Variation	± 20%
	Power Factor	> 0,99
	THDi	< 3%
<b>DC Output</b>	Nominal Voltage	91 ~ 145 Vdc
	Nominal Current	Up to 700 A
	Voltage Ripple	< 1% Vrms
	Efficiency	92%
	Static Regulation	± 1%
	Dynamic Regulation	± 5% (Stabilization time < 50 ms)
<b>TSU125 Rectifiers</b>	Input Voltage	220 Vac (90 Vac ~ 264 Vac)
	Efficiency	92%
	THDi	<3%
	Power	2900 W (176 ~ 264 Vac) / 1200 W (90 ~ 175 Vac)
	Maximum Current	22 A
	Operating Temperature	-40°C to +60°C (Linear derating from 100% to 40%)
	Dimensions (HxWxD)	111 mm x 88 mm x 270 mm (2U/A)
	Ventilation	Forced ventilation
<b>System</b>	Display	Graphic HMI 128 x 64 pixels
	Standard Communication Protocols	Modbus RTU - RS485 Dry Contact
	Ethernet Communication Protocols (optional)*	Modbus TCP DNP3 SNMP v1, v2c and v3 MMS IEC61850
	Additional Features	Current limitation at rectifier and battery output Battery test function Hour meter Recharge cycle counter Supervisory access via USB
	Optional	UDQ - Drop Diode Unit UQC - Drop Converter Unit Battery temperature sensor Battery disconnection via contactor Output relay expansion
	<b>Environmental Conditions</b>	Operating Temperature
Humidity		5% to 95% (Non-condensing)

\* Other options upon request.

# Discover other solutions from our portfolio



## Energy

Thyristor and Switched Rectifier  
Chargers  
(with and without battery bank)

Industrial and Commercial UPS  
(Modular)

BMS - Battery Monitoring  
System

DC/AC Inverters with static  
switch



## Integration

Electrical Panels for Auxiliary  
Services

Monitoring and Automation  
Systems



## Services

Maintenance contracts  
and specialized technical  
support

Spare parts supply

Retrofit and modernization  
services

24/7 hotline support

06-2025

**Get in touch and learn how to integrate  
these solutions into your project.**

## Need more information?



[www.teksea.net](http://www.teksea.net)

The information contained in this document consists of general descriptions of the available technical solutions and is for reference purposes only.

**TekSea Energy Systems Ltd.**

**Brazil - Santa Catarina**

Rua Adele Wruck, 59, Itoupavazinha  
ZIP Code 89066-354, Blumenau  
Phone: +55 47 3339-8179

**Brazil - São Paulo**

Av. Antônio Artioli, 570  
Sala Zug 62 – Swiss Park Office  
ZIP Code 13049-253, Campinas  
Phone: +55 19 3278-3022