



# MUST900

30-600 kVA

MODULAR THREEPHASE UPS

3:3

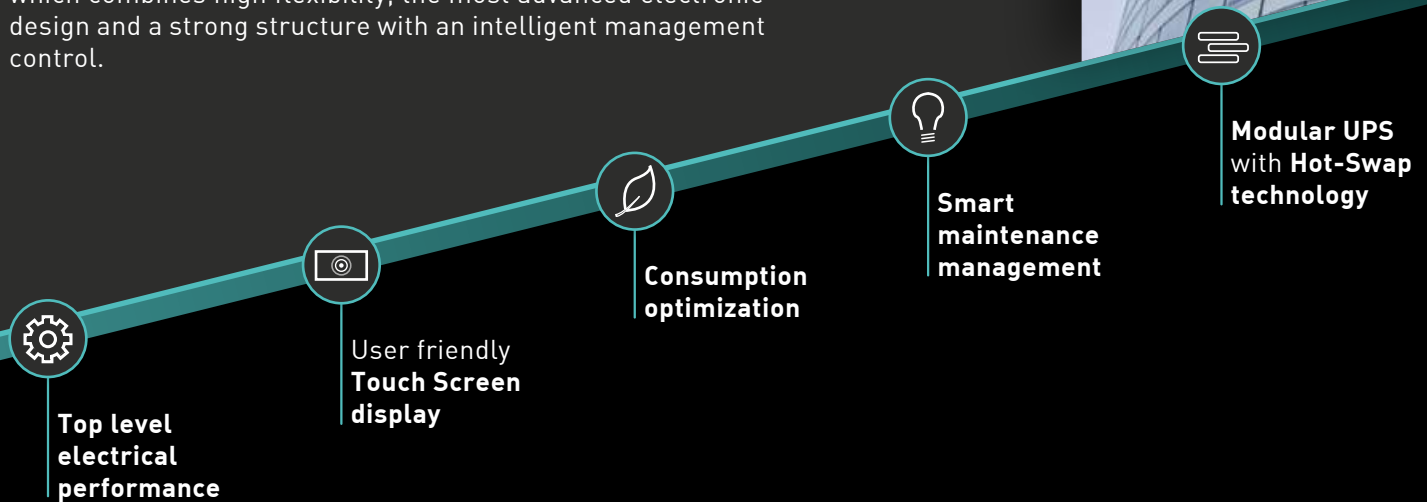
The ideal solution for:

- ✓ *DATA CENTER & SERVER*
- ✓ *INTERNET CENTERS, LAN*
- ✓ *CRITICAL APPLICATIONS*
- ✓ *TELECOMMUNICATIONS*



# OVERVIEW

MUST900 represents the last generation of modular UPS which combines high flexibility, the most advanced electronic design and a strong structure with an intelligent management control.



## BEST ELECTRONIC DESIGN

The **three level inverter technology**, with digital control, and the high quality components used, allow the best electrical performances such as an **efficiency of more than 95%** and an input PF 0.99, with a current distortion lower than 3% (THD).

## FLEXIBILITY

Modular UPS usually guarantees a higher availability in comparison with the stand-alone UPS. In MUST900 these characteristics are particularly evident, due to **its hot swappable components, such as the UPS units and the centralized bypass**. Moreover, with additional cabinets, working in parallel bypass, it can reach the large power of 900kVA.



## MAINTENANCE MANAGEMENT

Total control of all main important parameters in order to perform a preventive maintenance scheduling. **Battery test available in automatic or manual mode ensures to prolong the battery lifetime**. A pre-alarm signal indicates the battery change moment, before their end of life.

**Coated PCB boards** and an exclusive air ventilation system ensure a longer duration also in critical environment.

## EFFICIENT ENERGY SAVING

The possibility to control the UPS units, making them work in fewer number (**Sleep Mode**), means that UPS units work always at maximum efficiency point and so, the system relative consumption is the lowest possible. As a consequence, the electrical energy consumption and its costs are reduced.

# PRODUCT RANGE



## MUST900 - 180 KVA

This cabinet is built to host up to 6 units of power module 30 kVA. It is an ideal solution for a medium load that requires redundancy or the possibility to expand the power in the future.

It's possible to connect up to 5 cabinets.

**Maximum power:** 180 kVA, PF = 0.9



## MUST900 - 300KVA

This cabinet is designed to host up to 10 units of power module 30kVA. It is an ideal solution for medium to large load.

**Maximum power:** 300 kVA, PF = 0.9



## MUST900 - 600KVA

Built to host up to 20 modules of 30 kVA in 2 different cabinets. The bypass module, one for both cabinet, is hosted in a third cabinet.

**Maximum power:** 600 kVA, PF = 0.9



## PARALLEL OPERATION UP TO 900 kVA

MUST900 series allows to make parallel operation up to 3 cabinets. Each system can reach 300 kVA with 10 of 30 kVA power modules.

Additionally the Smart Parallel Management system optimizes the efficiency and the safety of this innovative machine.

**Maximum power:** 900 kVA, PF = 0.9



# DISPLAY AND COMMUNICATION

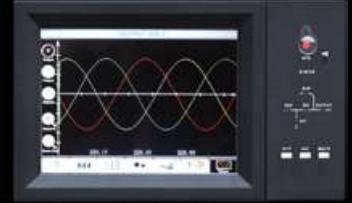
MUST900 has a very large touch screen display, complete and user friendly, that allows to record more than 1000 logs and to perform very accurate analysis. It is possible to monitor all main system parameters, including batteries health and their operating status. All settings are available from the LCD under a three-level password.



**10.4" colorfull display** equipped with EPO (Emergency Power Off button) and with Led status indicator integrated.



**Wide range of functional parameters can be** shown through digital or analog/digital indicators.



**Integrated oscilloscope** for easy and fast analysis of **Bypass voltage, output voltage and current waveform.**



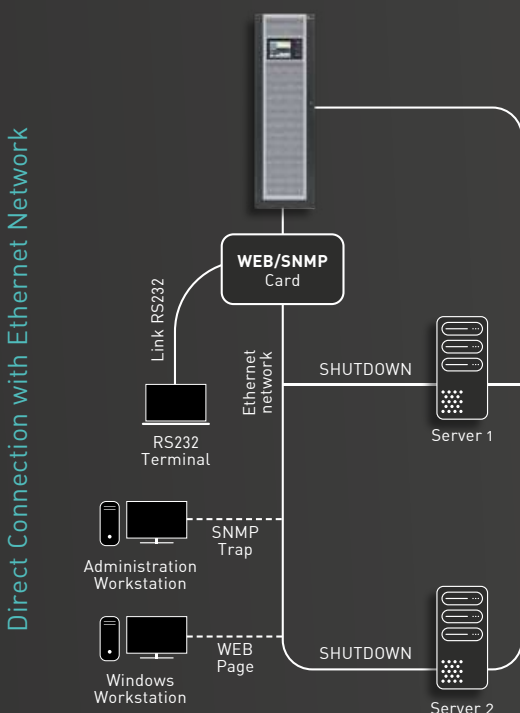
Discharging timer and total battery working timer permit a **prompt analysis** of battery health and allow to organize preventive battery maintenance scheduling.



**Total control and access** of all power modules parameters allows to monitor modules temperature, fans speed and **Smart Parallel Management mode.**



**First commissioning can be executed without using any external tools.** The three level password protects against accidental accesses and dangerous settings.



## ADVANCED COMMUNICATION

- Standard RS232 port and RS485 port, with Modbus interface protocol.
- Web/SNMP card: it allows UPS management across a LAN using any of the main network communication protocol – TCP/IP, HTTP and network interface via SNMP. In case of need it can notify users and administrators via email; if prolonged power failure occurs the protected computer systems can launch a safe shut down.
- Standard dry contact for input/output interface: the dry contacts can be programmed setting different meaning of the contacts.
- EPO (Emergency Power Off) equipped as standard.

# TECHNOLOGY

From the IGBT rectifier, to the three-level inverter, up to the innovative battery charging system: every single component of MUST900 is designed and manufactured taking care of every detail, leading the system to achieve the highest levels of efficiency in the UPS sector.

## ▶ RECTIFIER

- High performance IGBT rectifier technology, with PFC (power factor control).  
Input PF > 0,99.
- Totally digital controlled.
- Very low input harmonic distortion, less than 3%.
- Benefit: minimum impact on the mains and optimized upstream protection design.

## ⚡ STATIC BYPASS MODULE

- Centralized static bypass sized for the rated power.
- Totally hot swappable design to reduce at minimum the maintenance activity.

## 🔋 BATTERY CHARGER

- Independent powerful internal battery charger in each module.
- Up to 20% of the module's rated power is available to recharge batteries.
- Very wide range of battery capacity installable.
- Redundant battery charge distribution.
- Two level of battery charge, temperature control, end of discharge voltage control.
- Two type of battery test to prevent battery fault. Automatic self test.
- Optimized for the most common battery type.

## ⚡ INVERTER

- Three level inverter technology with IGBT, with high frequency modulation in PWM driving, that guarantees more than 95% efficiency.
- Output power factor 0.9.
- Totally digital control: thanks to the DSP a perfect sine wave is guaranteed even in case of unbalanced load.



Each single power module of MUST900 series is equipped with cutting-edge technology.

### LCD DISPLAY

The user friendly integrated display allows immediate analysis on main status and operation.

### COATED PCB BOARDS

They guarantee longer module lifetime, especially for dust environments and salt air conditions.

### AUTOMATIC CONFIGURATION

Each new module inserted in the systems makes an auto setup based on the new total power available.

### ADVANCED COOLING SYSTEM





The innovative cooling system allows to cut off the direct air flow on PCBs.

HIGH TECH DESIGN

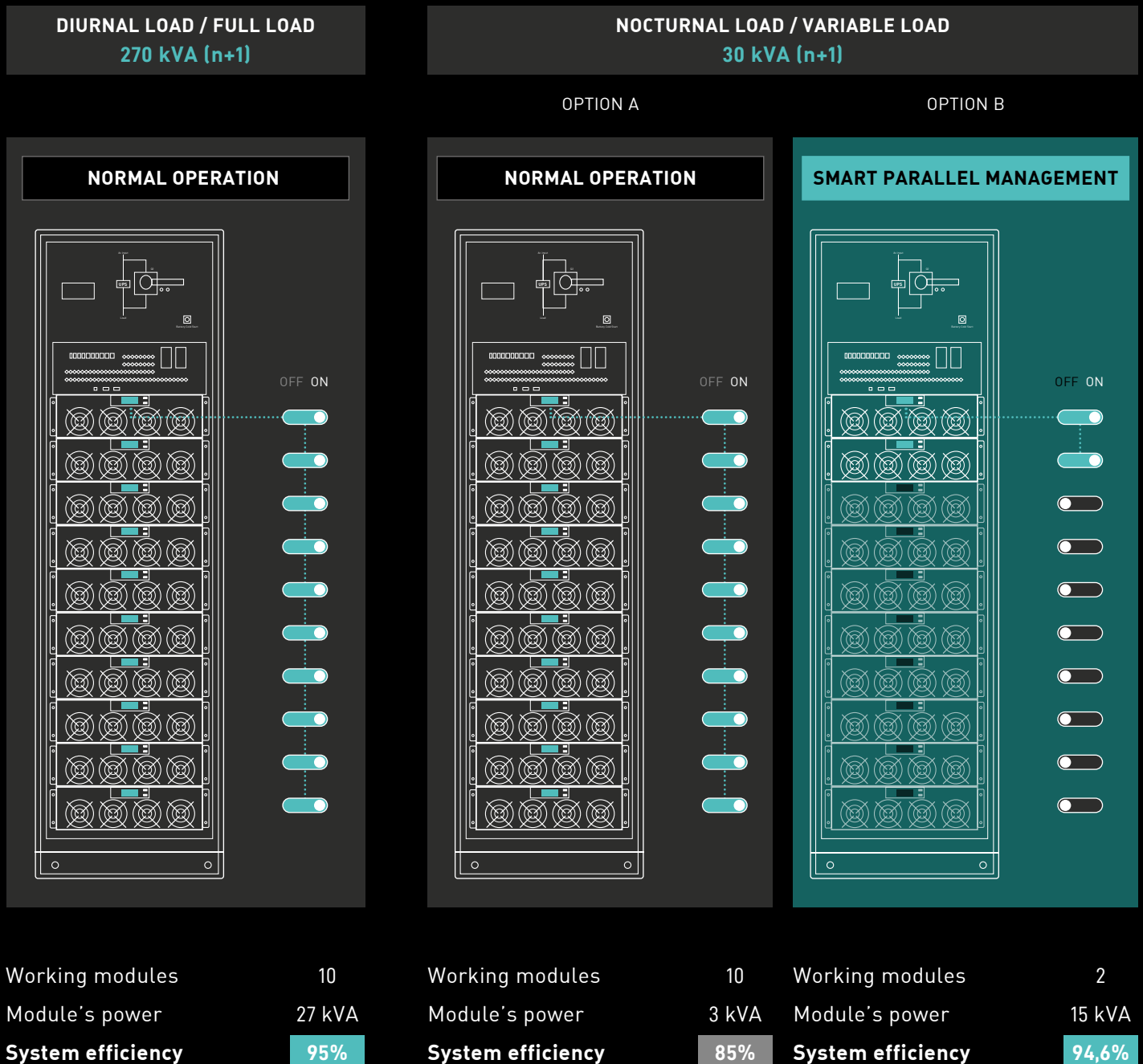
# SMART PARALLEL MANAGEMENT

Smart Parallel Management is the innovative power modules control system that maximizes UPS yield and life. Depending on the requirements, the system is able to automatically manage modules operation, switching them on and off according to load level and operating hours.

This special feature allows many advantages, especially in applications with high load variability:

-  Best efficiency
-  Longer equipment life
-  Lower maintenance costs
-  Reduced CO2 emissions

Here's a practical example of a variable load system, where a significant operation improvement is achieved thanks to the Smart Parallel Management function.



MODEL	MUST900-180	MUST900-300	MUST900-600
Maximum system power	180 kVA / 162 kW	300 kVA / 270 kW	600 kVA / 540 kW
Module power	30 kVA / 27 kW		
<b>MAIN INPUT</b>			
Grid system	3 Phases + Neutral + Ground		
Rated voltage / Frequency	380/400/415 VAC (Phase-Phase), 50/60 Hz		
Voltage range	304~478 VAC (Phase-Phase), full load 228V~304 Vac (Phase-Phase), load decreases linearly according to the min phase voltage		
Frequency range	40~70 Hz (rectifier operating range)		
Power factor	>0.99		
Current THDi	<3%		
<b>BYPASS INPUT</b>			
Grid system	3 Phases + Neutral + Ground		
Rated voltage / Frequency	380/400/415 VAC (Phase-Phase), 50/60 Hz		
Voltage range	Default: -20% ~ +15% Selectable: -40% ~ +25%		
Frequency range	Selectable, $\pm 1$ Hz, $\pm 3$ Hz, $\pm 5$ Hz		
Bypass overload	110%, long term operation 110%<load<125%, 5 minutes 125%<load<150%, 1 minute 150%<load<400%, 1 second load>400%, 200 milliseconds		
<b>OUTPUT</b>			
Rated voltage / Frequency	380/400/415 VAC (Phase-Phase), 50/60 Hz		
Power factor	0.9		
Voltage THDv	<1% (from 0% to 100% linear load); <5% (full non-linear load according to IEC/EN62040-3)		
Voltage precision	$\pm 1.5\%$ (0-100% linear load)		
Transient response	<5% for step load (20-80%; 100-20%)		
Transient recovery	<30ms for step load (0-100%; 100-0%)		
Inverter overload	110%, 60 minutes 125%, 10 minutes 150%, 1 minute >150%, 200 milliseconds		
Frequency regulation	50/60 Hz $\pm 0.1\%$		
Synchronized range	Selectable, $\pm 0.5$ Hz ~ $\pm 5$ Hz, default $\pm 3$ Hz		
Synchronized slew rate	Selectable, 0.5 Hz/S ~ 3 Hz/S, default 0.5 Hz/S		
Crest factor	3:1		
<b>BATTERIES</b>			
Battery rate voltage	$\pm 240$ VDC		
Charger voltage precision	1%		
Batteries arrangement	External		
Battery type	Pb / Ni-Cd		
<b>SYSTEM</b>			
Efficiency	Normal operation: >95% Eco Mode operation: 99% Battery operation: 95%		
Display	LED + LCD + Touch screen		
Protection degree	IP20		
Interface	Standard equipment: RS232, RS485, USB, dry contacts, Cold Start Optional: SNMP, parallel kit, dust filter		
<b>ENVIRONMENT</b>			
Operating temperature	0 ~ 40 °C		
Storage temperature	-40 ~ 70 °C		
Relative humidity	0 ~ 95% (no condensing)		
Noise (dBA at 1 meter far)	65 dB maximum		
Altitude	<1000 m; load derated 1% per 100 m, from 1000 ~ 2000 m		
<b>MECHANICAL DATA</b>			
Power module dimensions W*D*H (mm)	460*790*134		
Power module weight (Kg)	34		
Cabinet dimensions W*D*H (mm)	600*1100*1600	600*1100*2000	2000*1100*2000
Cabinet weight (Kg)	170	280	620
Colour	Cabinet: RAL 7021 Door: RAL 7012		

Note: technical specifications and data could be changed without notification

# GTEC SERVICE

GTEC supports its customers throughout the whole product life cycle, providing technical assistance and after-sales service at the highest professional standards, so to produce the best partnership experience.



**MAINTENANCE** is an essential activity in order to guarantee a safe and stable load protection. GTEC shows maximum care about this topic, providing the best service in terms of experience, instrumentation and safety level.



Through the dedicated **CALL CENTER**, customers receive prompt answers to any request, and the specialized technicians directly schedule maintenance activities.



The partnership between GTEC and its customers gets consolidated through the **TRAINING SESSIONS** proposal for technical staff, so that each user can operate on the UPSs with maximum consciousness and safety.



Also, in the GTEC Service offers, a **PROJECT CONSULTING** team is available, in order to provide the best solution according to the designer's needs.

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