



# MUST400

10-400 kVA TROFAZNI MODULARNI UPS



- + DATACENTRI & SERVERI
- + INTERNET CENTRI
- + LAN MREŽE
- + TELEKOMUNIKACIJE
- + MODULARNI, "HOT SWAP" DIZAJN
- + VELIKA PRILAGODLJIVOST OPTEREĆENJA, ZA LINEARNE I NELINEARNE TERETE
- + INTELIGENTNI MODULI I DIZAJN SISTEMA ZAŠTITE
- + OMOGUĆENA KONTROLA PARALELE KABINETA



# Povezivanje

## PODRŽAVA OPERATIVNE SISTEME

Windows; Linux; Novell Netware 3.x, 4.x, 5.x, 6; Mac OS X, 9.x; IBM OS/2 Warp i Server; HP OPEN VMS;

Najčešće korišteni UNIX operativni sistemi poput: IBM AIX, HP UNIX, SUN Solaris INTEL i SPARC, SCO Unix i UnixWare, Silicon Graphic IRIX, Compaq Tru64 UNIX i DEC UNIX, BSD UNIX i FreeBSD UNIX, NCR UNIX.

Kao standard, MUST400 ima lokalni monitoring software za jednostavno upravljanje UPS-om.

Software pokazuje informacije u realnom vremenu u formi grafikona i vrijednosti za važne podatke poput mrežnog napona, opterećenja UPS-a i napunjenosti baterija.

Detaljnim informacijama, omogućava daljinsku analizu log-ova UPS-a i radnih parametara te dijagnozu alarma. Prema instrukcijama, software izvodi automatsko i sigurno isključivanje servera i PC-jeva.

## Napredna komunikacija

- Standardni RS232 port i RS485 port sa ModBus interface protokolom.
- EPO (Emergency Power Off) za daljinsko nužno isključivanje UPS-a
- Web/SNMP adapter za upravljanje UPS-om preko LAN-a mrežnim protokolima (TCP/IP, HTTP i SNMP). Sistem upozorava korisnike i administratore preko e-maila, u slučaju dužih ispada kako bi se isključivanje potrošača obavilo sigurno.
- Relejni/AS400 adapter je interface za ulazne/izlazne beznaponske kontakte i AS400 seriju računara za industrijske i BMS sisteme

Direktna veza preko Ethernet-a



- Veliki LCD ekran osjetljiv na dodir
- Pregled svih važnih parametara sistema i modula
- Komande i podešavanja sa lozinkom u 3 nivoa
- LED za brzo upoznavanje statusa sistema
- EPO dugme za nužno isključivanje

## Product range

Every power module is equipped with:

**RECTIFIER** Advanced technology with IGBT rectifier. Minimum impact to the mains thanks to PFC (Power Factor Control) system: input PF 0,99. It means no harmonic distortions through the mains therefore very low THDi, less than 3%. Optimize the upstream infrastructure without over rating the supply device (ideal for gen-set and transformer supply).

**INVERTER** The inverter uses last generation technology with 3 level IGBT power technology and high frequency modulation with PWM driving. High performance digital control with DSP, very stable and perfect sinusoidal waveform even in case of unbalance load. High power density with PF=0,9 and efficiency at maximum level starting from even less than 50% of load. Efficiency up to 95%.

**BATTERY CHARGER** Each module has its own battery charger. It means redundancy and wide range of battery capacity installable. Smart battery management. Single and double level of battery charger, temperature compensation, end of discharge voltage control. Automatic self battery test to prevent battery fault. Optimized for the most common battery types as sealed VRLA, AGM or wet lead acid and NiCd.

**STATIC BYPASS** Centralized static bypass is sized for the full power of the system. Completely hot swappable bypass reduces at minimum the maintenance process and guarantees best availability levels.

# Product range

## MUST400 up to 120 kVA

This system is designed to house 6 units of power module 10 kVA or 20 kVA. It is the ideal solution for a medium load that requires redundancy or the possibility to expand the power in the future.

**Module and bypass HOT SWAP feature** contributes to guarantee an easy and safe maintenance.

It is possible to expand the power up to 360 kVA by connecting three cabinets in parallel.



## MUST400 up to 200 kVA

It is designed to house 10 units of power module 10 kVA or 20 kVA. It is an ideal solution for medium to large loads.

UPS capacity can be doubled to achieve 400 kVA by connecting two systems together.



## MUST400 up to 60 kVA with batteries on board

The solution can include three modules (10 or 20 kVA each), up to 4 x 40 batteries 9Ah/12V with batteries breaker (with autonomy 16 min for typical load of 32 kW in redundant N+1 configuration).

MUST400 60 kVA concept brings the advantages of **HOT SWAP** to modules of batteries, for quick and safe battery maintenance.



**HOT SWAP**



# Configuration

## POWER MODULE



10 kVA  
20 kVA



10 kVA  
20 kVA

## TOTAL POWER



60 kVA  
120 kVA



120 kVA  
240 kVA



180 kVA  
360 kVA



30 kVA  
60 kVA



100 kVA  
200 kVA



200 kVA  
400 kVA

# Green technology

## ENERGY SAVING

The high performance of MUST400 series is also evident for small percentages of applied load. Its efficiency is due to the 3-level IGBT architecture which is the state of art technology.

The extreme flexibility in use and the high performance, even at low percentages of load, mean faster return on investment compared to to the majority of UPSs on the market.

# Technical specifications

Model	MUST400-60	MUST400-120	MUST400-200
Maximum system power	60kVA/54kW	120kVA/108kW	200kVA/180kW
Module power	20kVA/18kW *		
<b>MAIN INPUT</b>			
Grid system	3 Phases + Neutral + Ground		
Rated voltage / Frequency	380/400/415VAC (Phase-Phase), 50/60Hz		
Voltage range	304~478 VAC (Phase-Phase), full load 228V~304Vac (Phase-Phase), load decreases linearly according to the min phase voltage		
Frequency range	40~70Hz		
Power factor	>0.99		
Current THDi	<3%		
<b>BYPASS INPUT</b>			
Grid system	3 Phases + Neutral + Ground		
Rated voltage / Frequency	380/400/415VAC (Phase-Phase), 50/60Hz		
Voltage range	Default: -20% ~ +20% Selectable: -40% ~ +20%		
Frequency range	Selectable, $\pm 2.5\text{Hz}$ , $\pm 5\text{Hz}$ , $\pm 10\text{Hz}$ , $\pm 20\text{Hz}$		
Bypass overload	125%, long term operation 125%<load<130%, 1 hour 130%<load<150%, 6 minutes load>1000%, 100 milliseconds		
<b>OUTPUT</b>			
Rated voltage / Frequency	380/400/415VAC (Phase-Phase), 50/60Hz		
Power factor	0.9		
Voltage THDv	<1.5% (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%, 1 minute 150%, 5 seconds >150%, 200 milliseconds		
Frequency regulation	50/60Hz $\pm 0.1\%$		
Synchronized slew rate	Selectable, 0.5Hz/S ~ 3Hz/S, default 2Hz/S		
Crest factor	3:1		
<b>BATTERIES</b>			
Battery rate voltage	$\pm 240\text{VDC}$		
Number of batteries	Standard: 40 batteries 12V Selectable: 32-44 batteries 12V (<36 only with reduced power, pf=0.8)		
Charger voltage precision	1%		
Batteries arrangement	Internal and/or external	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)	65dB maximum		
Altitude	<1000m		
<b>MECHANICAL DATA</b>			
Power module dimensions W*D*H (mm)	440*590*134		
Power module weight (Kg)	22		
Cabinet dimensions W*D*H (mm)	600*900*2000	600*900*1600	600*900*2000
Cabinet weight (Kg)	260	194	240

Note: technical specifications and data could be changed without notification

\*System can be setup with 10kVA/9kW power modules, upon request