



MUST 10 – 400

Modular UPS



10 – 200 kVA modular UPS, up to 400kVA

- + Datacenter & servers
- + Internet centers
- + Local Area Networks (LAN)
- + Telecommunication devices,
Emergency application



efficiency and reliability
in power supply solutions

Product overview



- + **MODULAR DESIGN, HOT SWAPPABLE**
- + **STRONG LOAD ADAPTABILITY FOR LINEAR AND NONLINEAR LOAD**
- + **INTELLIGENT MODULE AND SYSTEM PROTECTION DESIGN**
- + **LOW NOISE SYSTEM DESIGN**
- + **AVAILABLE PARALLEL CONTROL FOR CABINETS**

MUST 10-400 series is modular and online double conversion UPS for sensitive equipments. The power rating covers from 10kVA to 400kVA which delivers the best combination of reliability, functionality, hot-swappable and flexibility at a competitive price.

Solutions comparison

Modular solution MUST 10-400 (N+1) vs standalone UPS in parallel

+ **AVAILABILITY**

- Modular solution guarantees much more availability than a traditional standalone parallel solution
- MTTR MUST = 3 minutes
- MTTR standalone = 480 minutes
- MUST 10-400 is an hot swappable solution!

+ **COST, EFFICIENCY AND FLEXIBILITY**

In MUST 10-400 you can adapt the UPS with needed power capacity, step by step (small steps), keeping efficiency always at maximum level: in standalone solution, you have to add one more unit, with the same power, to the previous unit (big steps): that means low efficiency (more energy and cost) and spending more money to achieve the same needed steps, without gradual investment cost.

+ **SAVE SPACE**

In case you need to increase the power capacity of the UPS system, using the MUST solution it's enough to add one more module (same foot print); in standalone solution you have to add one more cabinet.

+ **LOWER SERVICE COST**

For the MUST 10-400, in site, you spend very little time to do the normal maintenance (cleaning, testing (automatic battery test), check the alarms recorded list, etc). Even the replacement of power module is very fast.



Connectivity devices

OPERATING SYSTEMS SUPPORTED

Windows 95-OSR2, 98, Me, NT 4.0, 2000, XP, 2003 and latest versions; Linux; Novell Network 3.x, 4.x, 5.x, 6; Mac OS X, 9.x; IBM OS/2 Warp and Server; HP OPEN VMS; The most widely used UNIX operating systems such as: IBM AIX, HP UNIX, SUN Solaris INTEL and SPARC, SCO Unix and UnixWare, Silicon Graphic IRIX, Compaq Tru64 UNIX and DEC UNIX, BSD UNIX and FreeBSD UNIX, NCR UNIX.

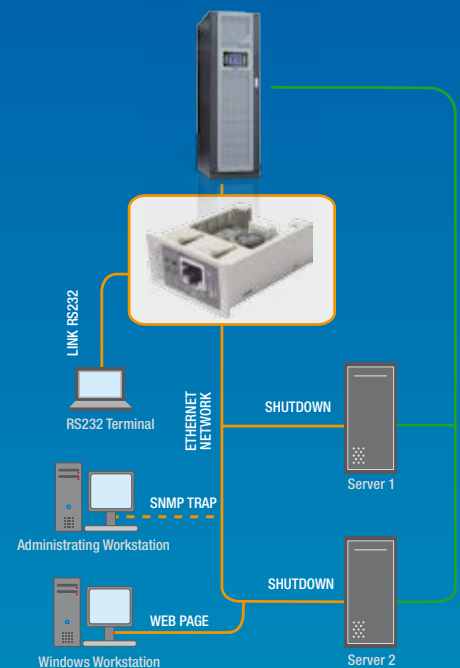


As standard the MUST 10-400 has local monitoring software through serial port, the **UPSilon** provides user-friendly UPS management. The software displays real time information in the form of bar charts and values for critical data such as mains voltage, UPS load and battery charge. It allows remote interrogation of UPS logs and operating parameters to help diagnose alarms and potential fault conditions. When instructed the software performs an automated safe power down of the protected servers and PCs.

Advanced communication

- Standard RS232 port and RS485 port with ModBus interface protocol.
- REPO (Remote Emergency Power Off) to power down the UPS through a remote emergency push button.
- **Web/SNMP card** allows UPS management across a LAN using any of the main network communication protocols - TCP/IP, HTTP and network interface via SNMP. In case of alert it can notify users and administrators via email; when prolonged power failure occurs the protected computer systems can be shutdown in a graceful manner.
- **Relay/AS400 card** is an easy interface for input/output dry contacts and AS400 series computer, the common manner for industrial and building management systems.

Direct Connection with Ethernet Network



- LARGE TOUCH SCREEN LCD DISPLAY
- ALL MAINS SYSTEM AND MODULES PARAMETERS AVAILABLE
- COMMANDS AND SETTINGS AVAILABLE WITH THREE PASSWORD LEVELS
- LEDS THAT INDICATE THE POWER FLOW FOR AN IMMEDIATE ACKNOWLEDGEMENT OF THE SYSTEM STATUS
- EPO: EMERGENCY POWER OFF BUTTON

The MUST system

MUST 60-120

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

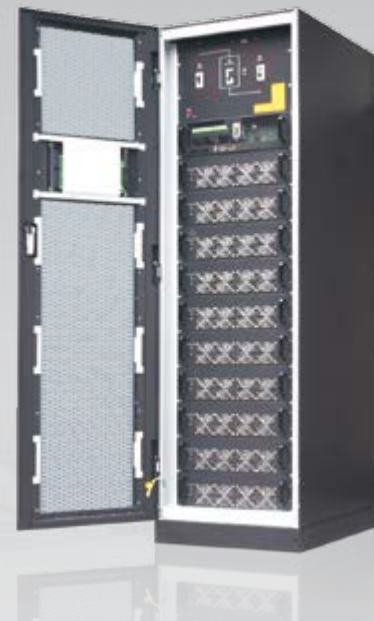
Its winning advantages against any conventional parallel UPS involve parallel configuration N+1, hot swappable and scalability, as well as easy maintenance. It is possible to expand the power to 360kVA by connecting up to three cabinets in parallel.



MUST 100-200

This cabinet is designed to house 10 units of power module 10kVA/20kVA. It is an ideal solution for medium to large load.

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

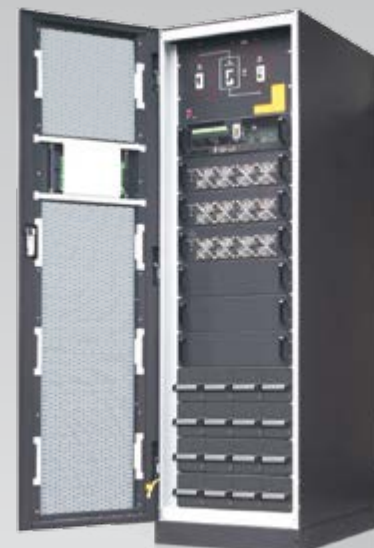


MUST 30-60 with batteries on board

Solution, including three modules (10 or 20kVA), max. 4 x 40 batteries 9Ah/12V, and batteries breaker, is available into the bigger cabinet (10 modules house).

In 19", is possible to house 4 battery modules, just to reach total 240 + 240 VDC, which is equivalent to one branch plug in system. (see pictures)

The max. capacity of this solution is 240 + 240 VDC/36 Ah.



The MUST configuration



The highest technology level

Power module 10kVA and 20kVA with rectifier, inverter and battery charger.

RECTIFIER: advanced technology with IGBT rectifier. Zero 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: : last generation technology using 3 level IGBT power bridge with 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 96%.



BATTERY CHARGER: distributed battery charger in each module. The power is 20% of the rated power. It means no single point of failure 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.

Centralized static bypass sized for the full power of the system. Completely hot swappable reducing at minimum the maintenance process. High quality SCR mounted inside in the auxiliary line and precise control.

The biggest and more complete user friendly touch screen. Easy to use and with wide range of information coming from the system status. With password protected level is possible to set the configuration of the system directly from the touch screen.

Benefits in your choice

MUST 10-400 has been designed to achieve the maximum energy saving.

Combination of several factors makes this result remarkable.

- High efficiency provided by the most recent electronic technology.
- Flat curve of efficiency in a large power range that minimizes energy losses at lower load.
- Modular structure that allows to achieve the requested power using only the necessary number of modules.
- Excellent input and output electrical performances such as very low harmonic distortion to the mains, which means a clean electrical network without disturbances to other critical loads, as well as lower energy losses.

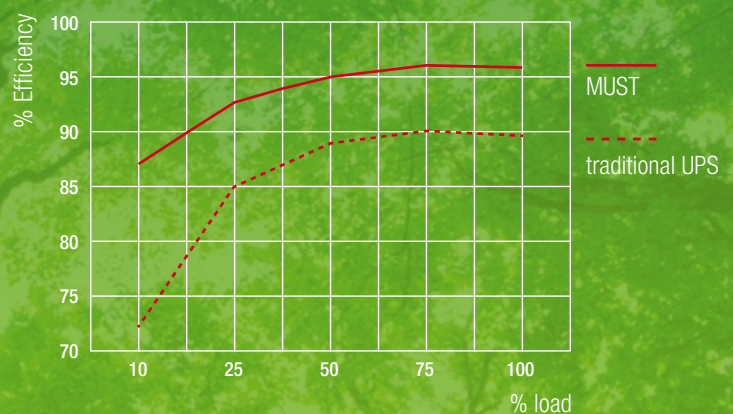


Green Technology

ENERGY SAVING

The high performance of the series MUST 10-400 is also evident for small percentages of the applied load. Its efficiency is due to the 3-level IGBT architecture which is state of the art technology.

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



Technical specifications

MUST 10-400			
CAPACITY	10-400kVA		
MAIN INPUT			
INPUT VOLTAGE	380V/400V/415V(line to line) 220V/230V /240V(line to neutral)		
INPUT FREQUENCY	50/60Hz		
POWER FACTOR	>0.99		
INPUT VOLTAGE WINDOW	-40%~+25%		
FREQUENCY WINDOW	40-70HZ		
BATTERY			
BATTERY VOLTAGE	±240VDC		
CHARGER POWER	10kVA: 3.1A 20kVA: 6.2A		
CHARGER VOLTAGE PRECISION	1%		
BYPASS			
BYPASS VOLTAGE	380V/400V/415V, line to line 220V/230V/240V, line to neutral		
BYPASS VOLTAGE WINDOW	-20%~+15%, full load		
BYPASS OVERLOAD CAPABILITY	125%, long time operation 125%< load <130%, last for more than 1 hour 130%<load<150%,last for more than 6 minutes >1000%, last for more than 100ms		
OUTPUT			
OUTPUT VOLTAGE	380V/400V/415V, line to line 220V/230V/240V, line to neutral		
VOLTAGE PRECISION	1% (balance load), 1.5% (unbalance load)		
VOLTAGE THD (TOTAL HARMONIC DISTORTION)	THD<1.5%(linear load), THD<5%(nonlinear load)		
POWER FACTOR	0.9		
PHASE TOLERANCE	120°±0.5° (balance and unbalance load)		
CREST FACTOR	3:1		
OVERLOAD CAPABILITY	110% transfer to bypass after 1hour 125%, transfer to bypass after 10minutes 150%, transfer to bypass after 1 minutes >150%, transfer to bypass after 200ms		
SYSTEM			
SYSTEM EFFICIENCY	Normal mode: 96% ECO mode: 99%		
BATTERY MODE EFFICIENCY	95%		
DISPLAY	LCD+LED, Touch screen and keyboard		
IP CLASS	IP20		
INTERFACE (COMMUNICATION PORTS)	RS232,RS485,Dry contacts,SNMP card,EPO,Generator interface		
INSTALLATION/CONNECTION*	Top or bottom cable connection		
WORKING TEMPERATURE	0-40°C		
STORAGE TEMPERATURE	-25°C~70°C		
RELATIVE HUMIDITY	0-95% (non condensing)		
NOISE (dB)	<55dB		
WEIGHT (Kg)	6-module cabinet	MUST 060/10, MUST 120/20	151KG
	10-module cabinet	MUST 100/10, MUST 200/20	182KG
	PM10	10kVA	21KG
	PM20	20kVA	22KG
DIMENSION (W*D*H) (mm)	6-module cabinet	600*900*1600	
	10-module cabinet	600*900*2000	
	Module (10kVA/20kVA)	440*590*134	

*It is recommended to refer to the product manual and settings compliant with legal standards
Note: product specifications are subject to change without further notice

G-Tec Service



G-TEC Service, our technical assistance facility uses highly trained engineers to provide a reliable support and after-sales service.

CALL CENTRE dedicated for connection to the G-TEC Service organisation. G-TEC Service personnel are always available and ready to provide advice and assistance regarding UPS installation, maintenance, fault finding and repair.

G-TEC Service can provide assistance during commissioning and startup of the UPS equipment on-site with additional training during handover to site personnel.

MAINTENANCE CONTRACTS can be provided by G-TEC Service to minimise respon-

se times and repair costs. Contracts range from periodic inspections to comprehensive cover including labour and materials.

FAST & READY: a fast repair on site is guaranteed through the use of state-of-the-art UPS technology, the professionalism of the UPS service personnel and Authorised Assistance Centres. UPS service guarantees that failed parts are replaced with original ones, tested and updated in order to maintain the safety, reliability and operating characteristics of the UPS.

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