Working in Power

MUST 1500

3 Phase Modular
Hot swappable, scalable UPS
40 to 1500 KW

- LOCAL AREA NETWORKS (LAN)
- SERVERS
- DATA CENTERS
- INTERNET CENTERS (ISP/ASP/POP)
- INDUSTRIAL PLCS
- EMERGENCY DEVICES (LIGHT, ALARM)
- ELECTROMEDICAL DEVICES
- TELECOMMUNICATION DEVICES
- INDUSTRIAL APPLICATION

MUST 1500

The **MUST 1500 series** is a true online double conversion uninteruptible power supply (UPS), three phase input/output with its single module capacity of 40KVA (40PM) and 50KVA (50PM) rated at unity power (PFI). The modular UPS systems are designed to cover a wide range of power ratings from 40KVA to 1.5MVA and is designed to deliver the best combination of reliability, functionality, hot swapping and flexiblity UPS system for medium, large data centers, server & IT applications, and protect industrial automation processes, medical & healthcare equipment and many other loads where operations are critical in nature.
The MUST 1500 series modular UPS combines the lastest three-level IGBT technology with DSP control arithmetic.
Along with high input power factor, low THDi and high efficiency, this product can achieve very high load adaptability.

The modular UPS ensures reliable and trouble free operation for the critical load. The MUST 1500 series is scalable. It can be easily expanded by adding power modules to the system to reach 500kVA/ KW in a single frame. It is possible to connect three frames in parallel to increase the capacity to a maximum of 1.5MVA/ MW power.

EACH 40PM & 50PM MODULE CONSISTS:

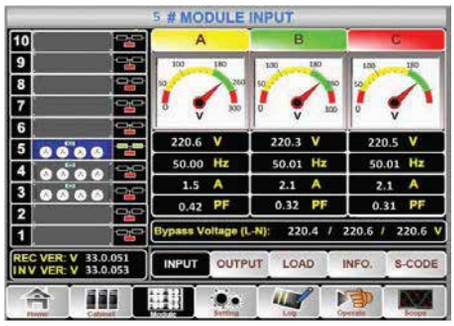
- **IGBT Rectifier**
  Advance technology achieving input THDi is <3% and input p.f is 0.99, thanks to the IGBT Rectifier with PFC control.
- **Battery Charger**
  Distributed battery charger in each module, it is capable of delivering up to 20% of the rated power per UPS module for battery charging. Thus a wide range of battery capacity can be connected to UPS for longer battery autonomy. An intelligent battery temperature compensation kit option is available. Adjustable battery end voltage control as standard to prolong battery life.
- **IGBT Inverter**
  New generation 3 level IGBT power bridge digital control utilising high frequency PWM modulation switching. High performance DSP control achieves system stability, reliability and efficiency. High efficiency up to 96% & unity output power factor (PFI)
- **Static Switch Inverter**
  It connects the load to Inverter while in normal operation.
- **Local LCD Panel**
  Each power module is designed with a local LCD panel which allows a quick glance of moudule status and measuremments

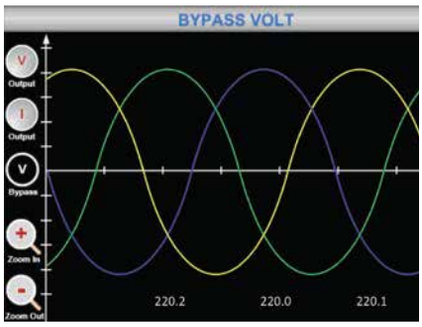
STATIC BYPASS MODULE

A fully rated static bypass for the UPS system ensures no interruption transfer from Inverter to the Bypass source if the Inverter overload limits are reached or if the Inverter becomes unavailable for any reason. Re-transfer from Bypass source to Inverter source with no power interruption. High quality SCR is designed for the bypass line with precision control.

LARGE LCD SCREEN

Large 10.4 inch color touch screen with comprehensive user friendly interface. Easy to operate and with wide range of information. Password control at different levels to allow configuration, parameter settings and graphical display of UPS directly from the touch screen.





SYSTEM ADVANTAGES

1. Highest reliability (MTBF of the power availability is much more than the stand alone UPS) & much lower Mean Time To Repair (MTTR). Average time to replace the module is less than 3 mins
2. With its swappable design, there is no supply interruption when replacing the faulty module
3. Precision control with double DSP controller per power module for Recitifier, Inverter, Charger & Super Charger
4. Compact foot print of 1.43m^2 in 500KVA single modular UPS chassis, makes it one of the smallest foot print among the competitors. Power expansion simply by adding similar capacity module without any downtime and extra footprint
5. Very low maintenance costs
6. Each power module is designed with intelligent battery charger, with adjustable charging current limit up to 16 Adc per module, with 10 parallel modules can reach up to 160 Adc without output load de-rated.
7. User friendly large touch screen LCD provides comprehensive UPS detail, command buttons and single line with superimposed LED's and EPO function.

UPS FRONT PANEL

LED

- REC - Rectifier ON/OFF Status
- BAT - Battery Charge/Discharge/ Failure/Abnormal Status
- INV - Inverter ON/OFF Status
- BYP - Bypass On Load Status
- OUT - Load On-Line/Abnormal Status
- STATUS - UPS General Status
- - Buzz
- EPO - Emergency Power OFF Button

Push Butttons

- BYP - Command transfer to bypass source
- INV - Command transfer to bypass inverter
- MUTE - Buzzer mute on or off

The MUST system

THE HIGHEST CLASS PERFORMANCES TO SUPPLY THE MOST CRITICAL LOADS

- LOCAL AREA NETWORKS (LAN)
- SERVERS
- INTERNET CENTERS (ISP/ASP/POP)
- DATA CENTERS
- HOSPITAL
- BANKS
- EMERGENCY DEVICES
- TELECOMMUNICATIONS DEVICES
- INDUSTRIAL PLC
- ALARM SYSTEM
- TRANSPORTATION

MUST 1500 series UPS Cabinet Configuration

Must 1500 is designed with 6 different chassis types for matching with different 40PM and 50PM power modules These are:

MUST 80i/40	For 40PM (40kVA/ 40kW)power module, PF1	In-built with manual bypass isolator
MUST 400i/40		In-built with input, bypass,output & manual bypass MCCB
MUST 100i/50	For 50PM (50kVA/ 50kW) power module, PFI	
MUST 200i/50		In-built with manual bypass isolator
MUST 300i/50		
MUST 500i/50		In-built with input, bypass,output & manual bypass MCCB

Fig. MUST 500i/50 Removable Modular Static Bypass Switch

Fig. MUST 500i/50

40PM & 50PM

The 3 phase power module can be paralleled up to 30 modules to achieve maximum power availability, scalability and redundancy. It is designed with local LCD, redundancy fans, high power density & channelled air-flow design seperating power and control compartment for excellent reliability. Hence, excellent maintainability and reliability are achieved.

5. Optional Items

Various optional hardware are available for different applications, these are:

- SNMP
- Battery compensation kit
- Dust proof kit
- Parallel kit
- LBS (Load Bus Synchronization)

BENEFITS TO USERS: ENERGY EFFICIENT UPS

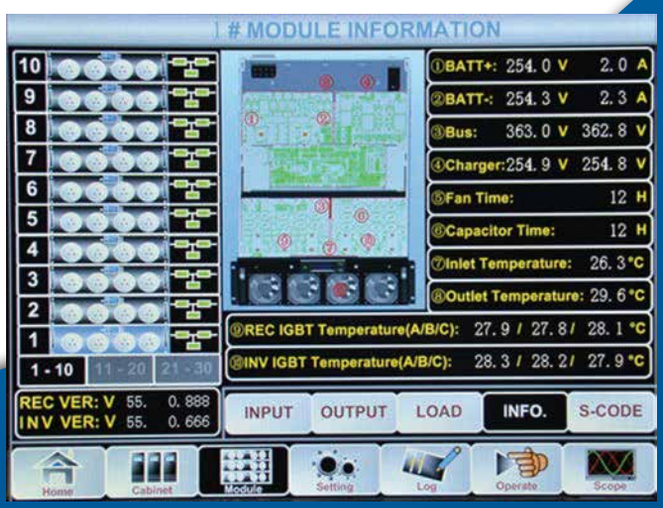
Energy saving function, some modules will be in idling mode when at low load consumption, so as to maximize overall system efficiency and pro-long life span of modules.

It is designed with three level IGBT power bridge introduced for Inverter, with high efficiency up to 96%, making MUST 1500 as one of the lowest cost of ownership as compared to conventional UPS.

Real time monitoring from LCD of major components in UPS for optimium perfomance of tjhe UPS system.

These include:

- ventilation fan operating hours
- capacitor operating hours
- Inlet air temperature
- Outlet air temperature
- 3 level rectifier IGBT
- 3 level inverter IGBT



Advance Communication Solutions

Standard in-built feature for remote communication

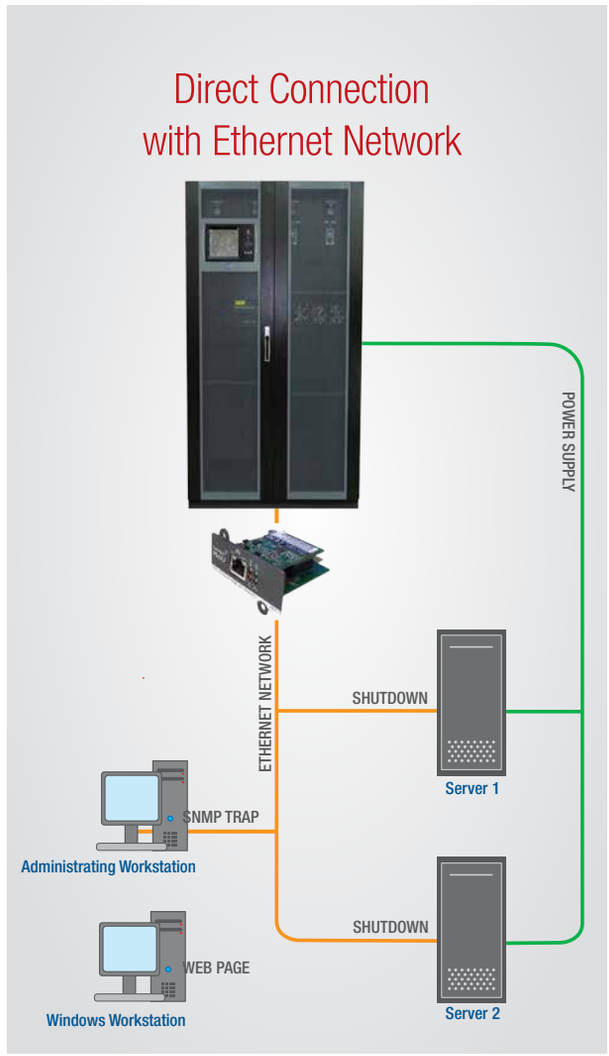
- Standard RS232 , USB & RS485 port with ModBus Interface Protocol
- External input signal to interface with UPS for battery & environment temperature
- REPO (Remote Emergency Power Off) for power down UPS from external signal
- Interface with generator for operating status, as well as driving signal for holding coil for battery circuit breaker
- Interface with Battery Circuit Breaker (BCB) for ON/OFF status
- Standard four alarm contacts for remote alarm reporting. These are: Battery Low, General Alarm, Mains Failure and Mains Normal

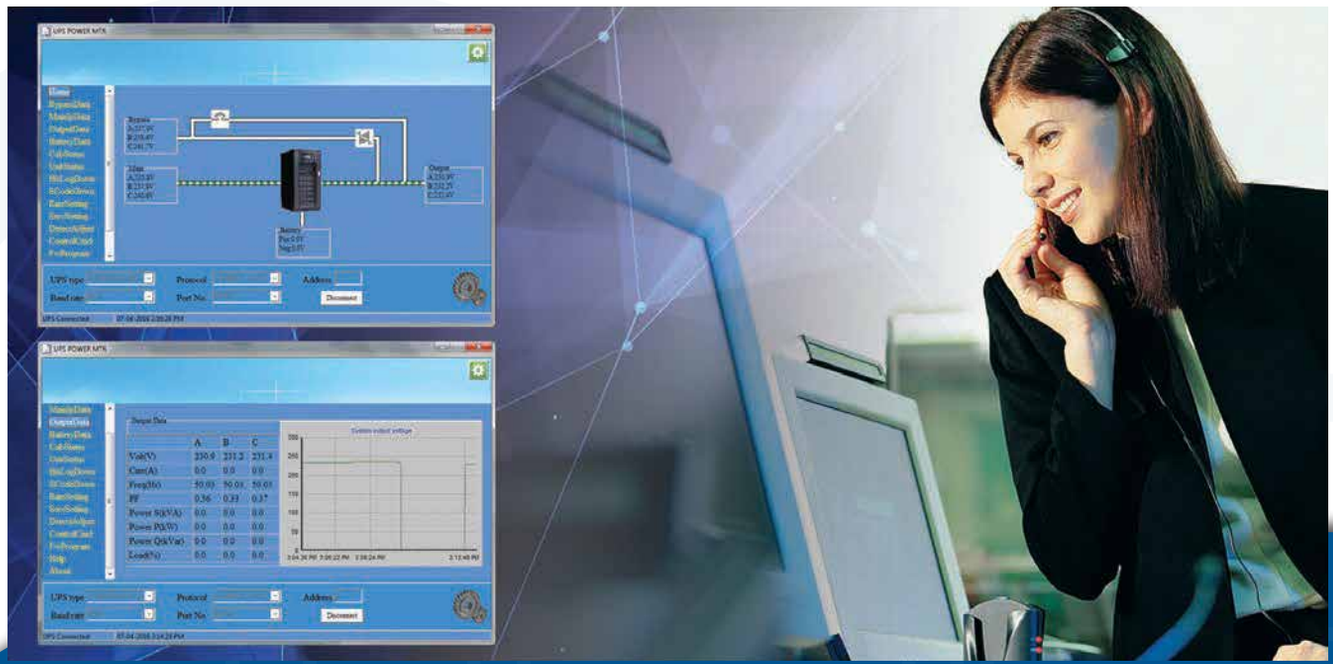
Other optional remotre monitoring and control feature:

- SNMP card allows UPS management across a LAN using any network communication protocol such as TCP/IP, HTTP, SMTP, DHCP, Telnet , BOOTP, DNS, DDNS, PPPoE, Wap, PDA Browser, SNMP RFC 1628 MIB, PPC MIB and Ethernet Up
- External Load Bus Synchronizer (LBS) port to interact with external Static Transfer Switch (STS) for highest system reliability

UPS Power Monitoring Software

Propriety UPS Power Monitoring Software provide comprehensive information of the UPS. Real time trackng can assist fast system recovery in the event of an emergency



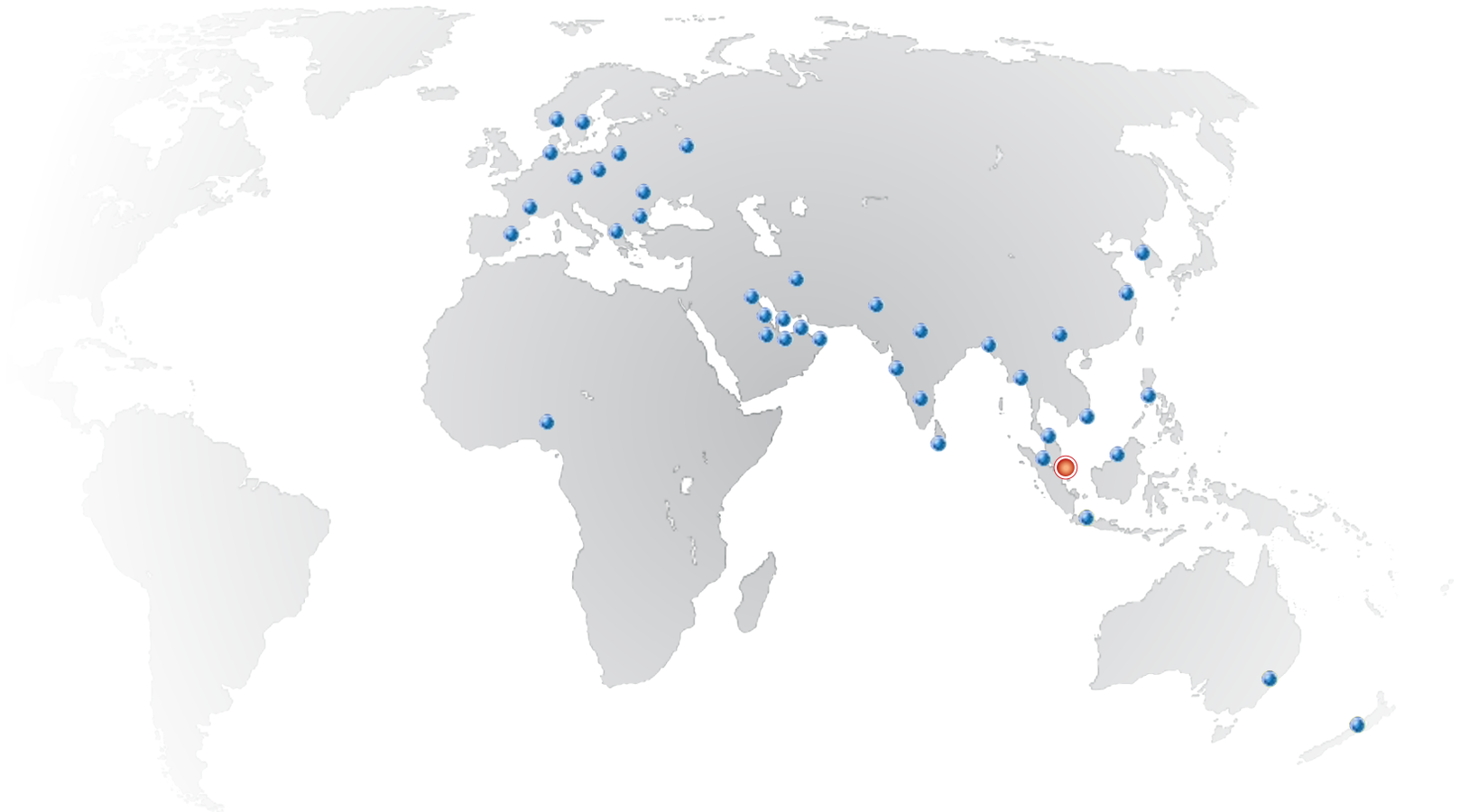


MUST 1500

	Technical Specification				
Models/Capacity	**40kVA – 1.5MVA** **40PM (40kVA/ 40kW), 50PM (50kVA/ 50kW)**				
	INPUT				
Rated Voltage (V)	380V/ 400V/ 415V, 3 phase + N				
Voltage tolerance (V)	304V ~ 478V line to line at full / 228V ~ 478V load decrease to 75%				
Frequency & Range	50Hz/ 60Hz auto sensing, 40Hz to 70Hz				
Input power factor & THDi	≥0.99 & ≤3%				
	BATTERY				
Type	VRLA battery; Vented lead acid battery & NiCad battery				
Charging Method	Two level & Cyclic charging according to EN 50272-2				
Ripple voltage	Approximately 0%				
	INVERTER OUTPUT				
Rated Power (kVA/ kW)	40kVA – 1.5MVA				
Module power factor	1 (40PM) / 1 (50PM)				
Rated Voltage & Stability (V)	380/220V, 400/230V, 415/240V ±1.5% from 0% to 100% linear load				
Frequency & Stability (Hz)	50/60 Hz ± 0.1%				
Dynamic Stability (V)	<5% for step load according to IEC62040-3				
Overload	110% for 60mins; 125% for 10mins; 150% for 1min; >150% for 200ms				
	BYPASS				
Rated voltage (V)	380V/ 400V/ 415V, 3 phase + N				
Voltage tolerance (V)	Default -20% / +15%. Upper threshold: 418V ~ 518V selectable, lower threshold: 228V ~ 342V selectable				
Frequency & Range	50/60Hz, selectable ±1Hz, ±3Hz, ±5Hz				
Rated current (A)	121A ~ 758A depending on chassis model				
	ENVIRONMENTAL DATA				
Operating Temperature	0°C to 40°C, VRLA battery life is halved for every 10°C increase in temperature from 20°C				
Relative Humidity	<95% non-condensing				
Colour	RAL 7012 front panel / RAL7021 for side panel				
Efficiency	Up to 96% at On-line mode				
Compliance Standard	General & Safety: IEC EN62040-1-1; EMC: IEC EN62040-2 (C3); Performance & Test: IEC EN62040-3				
Noise level @ 1m (dBA)	65dBA at 100% load, 62dBA at 45% load				
	MODULE PHYSICAL DATA				
Module Model	**40PM**		**50PM**		
Size (LxDxH) mm & weight	510 x 700 x 178, 44kg		510 x 700 x 178, 45kg		
	CHASSIS PHYSICAL DATA				
Chassis model	**MUST 80i/40, MUST 100i/50**	**MUST 200i/50**	**MUST 300i/50**	**MUST 400/50**	**MUST 400i/40, MUST 500i/50**
Size (LxDxH) mm & weight	600 x 980 x 1150, 120kg	650 x 960 x 1600, 170kg	650 x 1095 x 2000, 220kg	1050 x 1100 x 2000, 350kg	1300 x 1100 x 2000, 450kg
In-built breakers/ isolator	MCCB (Input, Bypass, Output & Manual Bypass)	Load Break Switch	Load Break Switches	Load Break Switches	MCCB (Input, Bypass, Output & Manual Bypass)
Cable entry	Bottom		Top	Top & Bottom	Top & Bottom
Compliance standards	EN50091-1-1/IEC62040-1-1/AS62040-1-1 for General & safety requirements for UPS used in operator access areas EN50091-2/ IEC62040-2/ AS62040-2 (C3) for EMC for UPS EN50091-3/ IEC62040-3/ AS62040-3 for Method of specifying performance and test requirements of UPS				
Cabinet protection rating	IP20				
Interface	Standard: Dry contacts, RS232, RS485, USB / Optional: SNMP				

UPS specification and data may subject to change for improvement without prior notice

G-Tec Asia Pacific Pte Ltd



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