

MUST modulare USV-Systeme 15- 120KVA von EBT



MUST 30-120

3 Phase Modular UPS

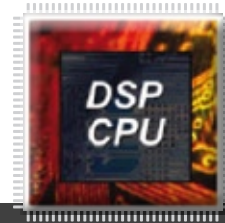
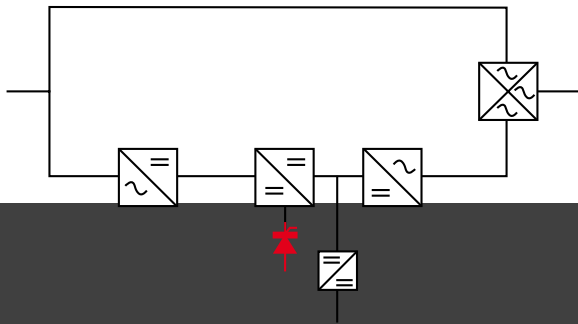
Finally the benefits of Modular UPS are for all

MUST 30-120

MUST means **Modular UPS System Three-phase**

MUST 30-120 is an uninterruptible power supply with double conversion technology, the System is fully modular with three-phase input and output, the maximum rated capacity is 120kVA

The G-TEC's modularity is based on **Independent Parallel Architecture** concept, in fact each power module is a complete UPS, equipped with all individual power stages: rectifier AC/DC, batteries charger, inverter DC/AC, static transfer switch, DSP control with microprocessor technology.



Powerful **DSP of last generation**, integrated in MUST-PM module allows decentralized control.

The absence of common power stages and controls, eliminates the single points of system failure, so that MUST becomes the best solution for the most critical loads, because the redundancy in all own parts.

The MUST UPS system is composed by **MUST-PM power module** of 15kVA each, inserted in 19 inches cabinets. MUST-PM with his own 13cm (3U) height emerges as the largest power density UPS in the market, excellent efficiency and reliability.

The scalability of MUST-PM modules allows a gradual investment following the growth of electrical loads on site, as a matter of fact only the necessary power modules should be installed in order to satisfy the real needs.

The opportunity to configure the UPS system through 'bricks' affords to optimize the energy leakages of own UPS device, setting the working point at the best value of efficiency.



The MUST-PM module is **the safe swapping**, so the module can be added or replaced in MUST cabinet without transferring the load to raw mains; it means no downtime and no risk.

The safe swapping doesn't need any further settings and the system realizes automatically by it-self the own power capacity. No downtime means the system will be able to feed safely the loads in all his life, even during maintenance.

The MUST flexibility and scalability make the UPS extremely easier and cheaper in services and maintenance operations, which will be carried out also by not-trained people.



UPS FRONT PANEL



- MENÙ:**
- | | |
|---------------------------|-------------------------|
| 1. System on | 5. History |
| 2. System stand-by | 6. Diagnostic |
| 3. Temperature | 7. Configuration |
| 4. Command | |

SYSTEM ADVANTAGES

- 1.** Highest reliability (MTBF of the supplying chain 100 times more than the stand alone UPS)
- 2.** Replacement of the fault module, with no supply interruption, (Hot swap)
- 3.** Time to replace the module < 3 min
- 4.** Power increasing simply by adding a module unit
- 5.** Very low maintenance costs
- 6.** Each module is a complete and independent Uninterruptible Power Supply

THE HIGHEST CLASS PERFORMANCES TO SUPPLY THE MOST CRITICAL LOADS

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

The MUST system

1. MUST 30

MUST 30 is the entry level to the MUST Family. It is the ideal solution to supply a medium load that requires the redundancy or the possibility to expand the power in the future. Its advantages win against any stand alone UPS solution. The solution is very compact and with the possibility to expand also the autonomy adding up to 3 battery banks in the same cabinet. Power ranging from 15 kVA to 30 kVA (2 modules), 19" rack mounted with the internal battery pack.



2. MUST 60

Modular UPS three phase system ranging from 15 kVA to 60 kVA, 19" rack mounted with the internal battery pack. This solution can include 4 modules 15 kVA providing the following back up time at 75% of nominal load.

Max back up time with internal battery pack

Nr power modules	kVA	kW at 75% of the rated load	backup time (min)
1	15	9	75
2	30	18	32
3	45	27	16
4	60	36	12

If redundancy is requested (N+1 modules) the max output power will be 45 kVA



3. MUST 120

Modular UPS three phase system ranging from 15 kVA to 120 kVA, 19" rack mounted, designed for external battery cabinet. The max output power of the MUST cabinet is 120 kVA (8 modules 15 kVA/each). The battery pack are included in the external cabinet. If redundancy is requested (N+1 modules) the max output power is 105 kVA.



4. MODULAR BATTERY CABINET (Dimensions HxDxW 2000x1000x800 mm)

It is designed to include up to 40 x 100 Ah battery blocks. This battery pack, with a 75% of the max load, allows a standard autonomy of 20 minutes. Longer back up time is possible simply adding battery cabinets, working in parallel or using other battery packs in shelves.



BATTERY CABINET

User interface

Communication board RS 232, RS 485 => STANDARD

Remote UPS monitoring for alarms, status, measures, historical data.

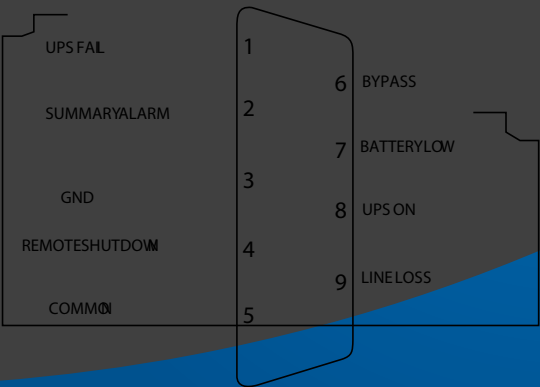
Communication board SNMP, relay card => OPTIONAL



SNMP Board



Free contacts circuit board

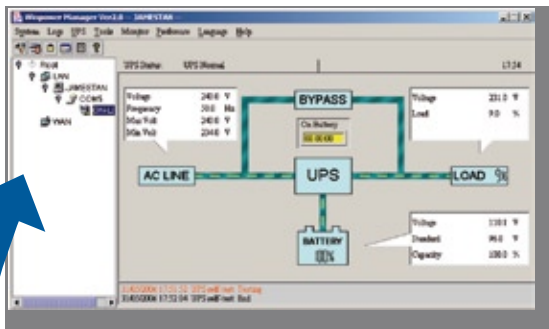


Pin #	Description	I/O
1	UPS Fail	Output
2	Summary Alarm	Output
3	GND	Input
4	Remote Shutdown	Input
5	Common	Input
6	Bypass	Output
7	Battery Low	Output
8	UPS ON	Output
9	Line Loss	Output

Communication interface card AS 400/dry contact.

A very Complete Communication

WinPower Manager



UPS Control Parameters

The UPS Control Parameters configuration window allows users to set various parameters for the UPS system. The parameters are organized into sections:

- Input Frequency Range:** Low Limit (40.0 - 48.0) Hz, High Limit (50.0 - 60.0) Hz.
- Voltage Range on Bypass:** Low Limit (180 - 210) V, High Limit (220 - 240) V.
- Panel Control:** Allow Off-Key to Enable/Disable Audible Warning When (UPS) Warns on Bypass, Allow On-Key to Enable/Disable Audible Warning When (UPS) Warns on Battery Mode.
- Audible Warning:** Bypass Audible Warning (On/Off), Battery Mode Audible Warning (On/Off).
- Operation Option:** Work On Bypass When UPS Turned Off, Auto Reboot UPS When AC Input Restored.

Event Log

The Event Log window displays a list of events that have occurred. The events are listed in a table with columns for Event Action, Record, Broadcast, Email, Send SMS, and Send Pager. The events include:

- UPS Battery Low
- UPS Battery Time Exhaust
- UPS Fail
- UPS Output Overload
- Communication Lost
- AC Fail
- On Bypass
- Bypass without output
- Self-test Fail
- Phase sequence incorrect in Bypass
- Battery switch not engaged
- Load unbalance
- Load too high
- Internal warning
- Maintain cover is opened
- Bypass not available
- AC Restore
- Communication Create

Shutdown Parameters

The Shutdown Settings configuration window allows users to set various parameters for the shutdown process. The parameters are organized into sections:

- Shutdown Options:** Shutdown Mode (ON-LINE), Battery Backup Time (10 min), Begin Shutdown Immediately while Battery Low (checked), System (checked), Shutdown (unchecked), Suspend (unchecked), System shutdown need time (2 min), Remote Shutdown by Agent (unchecked), Run Command File before Shutdown (unchecked), Shutdown File Max Execution Time (1 min).
- Shutdown Remote Agents:** Shutdown Conditions, Agent to be shutdown, Add, Modify, Remove.
- Shutdown Alarm Parameters:** Shutdown Alarm Interval (1 min), Start Warning before Scheduled Shutdown (10 min).

MUST 30-120

TECHNICAL SPECIFICATIONS	
MODEL	MUST 30/60/120
Nominal power	from 15kVA to 120kVA
INPUT	
Voltage	380V/400V/415V, 3 phases 4 wires
Voltage tolerance	294Vac to 520Vac
Frequency	50/60 \pm 4Hz
Power Factor	\geq 0.99
THDi %	< 5%
BYPASS	
Voltage	380V/400V/415V, 3 phases 4 wires
Voltage tolerance	305Vac to 457Vac (selectable)
OUTPUT	
Voltage	380V/400V/415V, 3 phases 4 wires
Static voltage stability	\leq 1.5%
Frequency	50Hz / 60Hz \pm 0,05% (battery)
Power factor	0,9
Overload protection	Load < 105% no transfer to bypass; 105% \leq load < 115% transfer to bypass after 5 min; 115% \leq load < 125% transfer to bypass after 1 min; load \geq 125 % transfer after 1 sec.
MODULE	
Nominal power	15kVA / 13,5 kW
Efficiency	\geq 94% already with load \geq 50%
BATTERY	
Battery nominal voltage	480 Vcc
Battery connections	3 wires (positive / neutral / negative)
Charger output voltage	273 \pm 1% Vdc
Type	VRLA sealed
Max changing current	4,5A for each module (selectable by LCD display)
MECHANICAL	
Acustical Noise (at 1 mt from the UPS with 8 modules)	\leq 62dB
Ambient operative temperature	0°C - 40°C
Relative umidity (Max)	90% (non condensing)
Ambient store temperature	-15°C - +55°C
Module weight	35kg
Module dimensions (mm)	440(W) x 700(D) x 131(H)
MUST 30 Dimension (mm)	600(W) x 1000(D) x 1500(H)
MUST 60 Dimensions (mm)	600(W) x 1000(D) x 2000(H)
MUST 120 Dimensions (mm)	600(W) x 1000(D) x 2000(H)
STANDARD NORMS	
Safety	EN50091-1-1/EN62040-1-1
EMC	IEC 61000-4-2(L3); IEC 610004-3(L3); IEC 61000-4-4(L3); IEC 61000-4-5(L4); EN 50091-2(>25A) Class A

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

G-Tec Companies are also present worldwide with Business Partners in several countries.

G-Tec Europe Srl in Vicenza – Italy

G-Tec Asia Pacific Pte Ltd in Singapore



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