

Quality Energy Provider



MUST AC

**AN OPTIMAL SOLUTION FOR
SMALL AND MEDIUM DATA CENTER**

- OPTIMIZED SPACE; VERY EASY INSTALLATION;
DON'T NEED A SPECIAL ROOM
- EXCELLENT TEMPERATURE CONTROL, FOR VERY CRITICAL LOADS, INDEPENDENT FROM ENVIRONMENTAL CONDITIONS
- LOW POWER CONSUMPTION
- PERFECT ELECTRICAL POWER SUPPLY, STABLE, REDUNDANT, WITH CONTINUITY OF POWER SUPPLY, NOISE-FREE
- MUST AC IS READY FOR FUTURE EXPANSIONS OF THE COMPUTER SYSTEM

MUST^{AC}

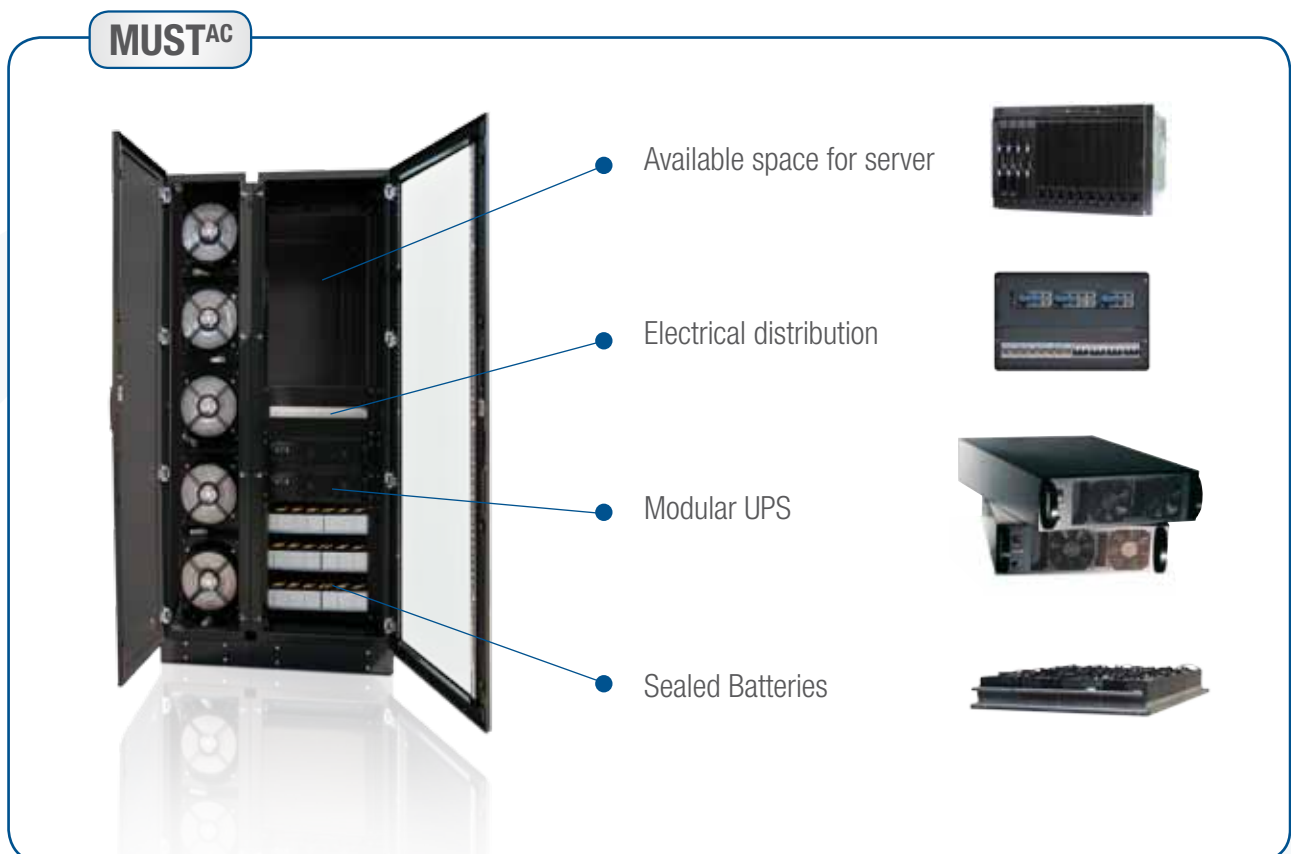
Description of the system

The modern Data Center needs considerable electrical power, even used to cool the system. The infrastructures have become more and more important and expensive: consider for example the concentration of heat produced by modern “blade servers” and the dissipation within a limited temperature window, or shortage of open spaces. It's a **must** to optimize space and power consumption.

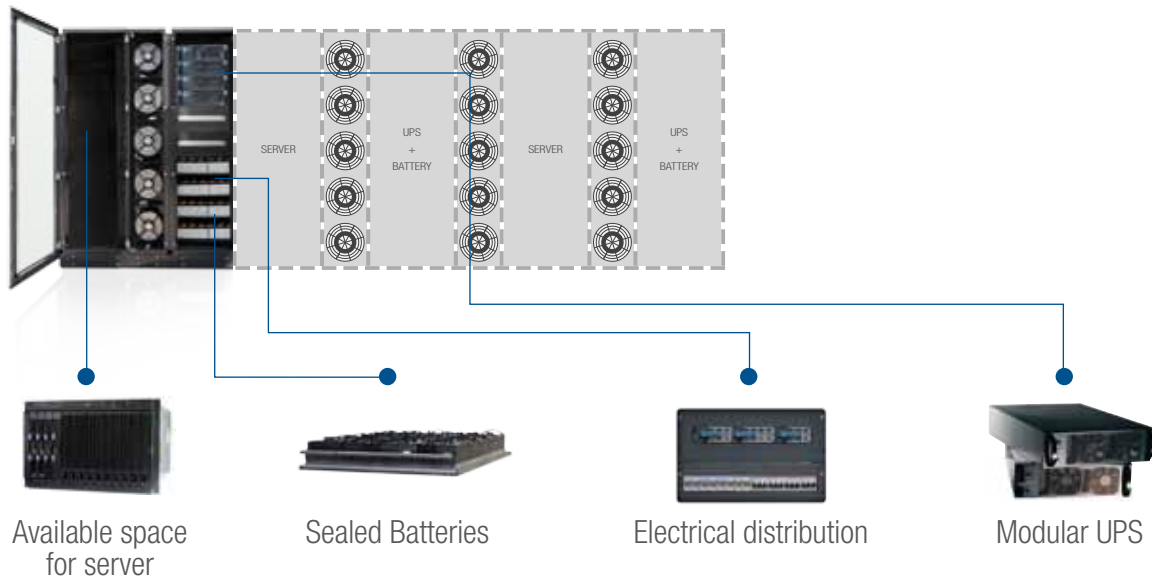
MUST^{AC} is our solution for a small and medium-size Data Center.

MUST^{AC} range includes several solutions for the different Data Centers power requirements. From the small MUST^{AC} in a sole cabinet, that is like a small data center room, to the modular MUST^{AC} that is designed to satisfy the most powerful computers.

MUST^{AC} is an air-conditioned cabinet: inside is located the server (and its accessories as hubs, switch boards, etc ...), and the redundant modular uninterruptible power systems (UPS) with their sealed batteries. The air conditioner automatically optimizes both the temperature inside the cabinet and the energy consumption.



MUST^{AC} MODULAR SYSTEM



Components of the system

The system is made of 3 main units:

- External Refrigerant Unit: can work with water as refrigerant, named ERW (see fig. 2), or with gas as refrigerant, named ERG (see fig. 1).
- Cabinet with cooling system inside, connected to external refrigerant unit through two pipelines (named CSW if water, or CSG if gas).
- Cabinet that can house UPS, batteries and server or only server named SU.

fig. 1 COOLING SYSTEM UNIT



fig. 2 COOLING SYSTEM UNIT



How the MUST^{AC} system works

The system is a closed system: the cold air comes out (forced by fans) from the front side of the cooling module: then is sucked in UPS and servers by fans. The hot air comes out from the rear part of UPS and servers, and is sucked in the cooling system. A special membrane parts the hot from the cold air.

The fans in the cooling unit are redundant and with variable speed, to optimize the energy consumption, and can quickly be replaced without stopping the system.

The system is supplied by modular, redundant (N+1) UPS on line, which provides for continuity of power supply (perfect sinusoidal waveform, noise free). The inner sealed batteries provide the energy reserve in case of blackout of the mains.

The MUST^{AC}, in a sole cabinet can be equipped with the water or gas refrigerator system, and respectively provided with an external chiller unit or a motor condensing unit. Following the standard data.

Technical Data					
WATER SYSTEM MODEL		ACW161	ACW162E1	ACW222E1	ACW323E1
Total cooling capacity	kW	16	16	22	32
Number of fans	N°	3	3	5	5
Air/flow max. (automatic variation of speed)	m3/h	2600	2600	4000	4000
Water flow (at 7-12 °C)	l/h	3700	3700	5070	6200
UPS (N+1)					
N° modules	N°	1+1	2+1	2+1	3+1
Power/module	kW	12	12	12	12
N° Batteries 9Ah/12V	N°	80	120	120	160
Back up time (N UPS load)	min	20	15	15	11
Input voltage	V/ph/Hz	400/3+N/50			
Output voltage	V/ph/Hz	400/3+N/50			
Cabinet Physical Data					
Weight	Kg	720	1180	1125	1310
Width	mm	950	1550	1550	1550
Height	mm	2100	2100	2100	2100
Depth	mm	1200	1200	1200	1200
Server rack unit available	U (44,45mm)	19	42	42	42
External chiller unit					
Input voltage	V/ph/Hz	400/3+N/50			
Cooling capacity	kW	16	16	22	32

GAS SYSTEM MODEL		ACG081	ACG081E1	ACG 202E1
Total cooling capacity	kW	8	8	20
Number of fans	N°	3	3	5
Air/flow max. (automatic variation speed)	m3/h	2600	2600	4000
Gas refrigerant		R410A		
UPS (N+1)				
N° modules	N°	1+1	1+1	2+1
Power/module	kW	12	12	12
N° Batteries 9Ah/12V	N°	80	80	120
Back up time (N UPS load)	min	20	20	15
Input voltage	V/ph/Hz	400/3+N/50		
Output voltage	V/ph/Hz	400/3+N/50		
Cabinet Physical Data				
Weight	Kg	720	980	1125
Width	mm	950	1550	1550
Height	mm	2100	2100	2100
Depth	mm	1200	1200	1200
Server rack unit available	U (44,45mm)	19	42	42
External motor condensing unit				
Input voltage	V/ph/Hz	400/3+N/50		
Cooling capacity	kW	8	8	20

MUST^{AC}

MUST^{AC} is a modular system that can be built in different configurations, depending on the needs of the Data Center. Its special feature is the possibility to be adapted to the Data Center power and dimensions. Moreover it can grow with the Data Center starting from a basic standard configuration optimizing in this way the investment costs to the real needs.

Basically two different cabinets are available.

Cabinet CSW or CSG. These are the cooling cabinets and they can work with chilled water or refrigerant gas in connection with the external units. They are combined in the modular system to cool the apparatus for server and power UPS. Their number depends on the installed power.

Cabinet SU. This type of cabinet can include the server or the battery or the UPS or a combination of them.

As from the figure below, it is possible to expand the system combining the two different cabinets depending on the Data Center requests.

The MUST^{AC} smallest configuration includes two cabinets: one cabinet SU for the UPS, battery, and server, and the other cabinet for cooling type CSW or CSG.

Below is a typical configuration with two cabinets CSW, two cabinets SU for server apparatus and two cabinets SU for UPS and Battery.



MUST AC

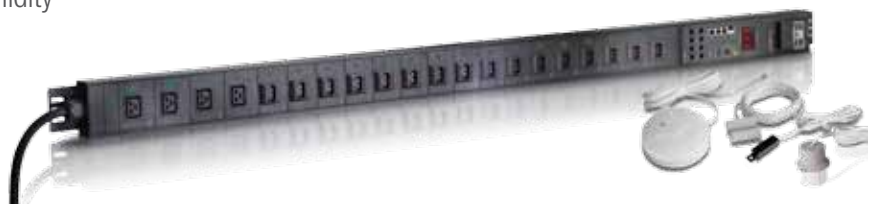
OPTIONAL ACCESSORIES

PDU POWER DISTRIBUTION UNIT

Bar of 20 sockets for servers: it is possible to control (from remote point) each single socket, including on /off switch by program, load current, environment temperature, humidity, water, smoke, open doors.

Probe available for:

- Open door
- Environment temperature and humidity
- Smoke
- Water



FG FIREGUARD

Fire monitoring unit, with 2 smoke probes plus 2 thermo sensitive cables: to switch off the fire there is a special gas cylinder



KVM SWITCHES

Monitor and control servers from a single console rack version: switch with 8 or 16 ports, keyboard and touchpad.



KEYPAD MODULE

The Keypad Module is the processing unit of the Stand-alone electronic locking system.

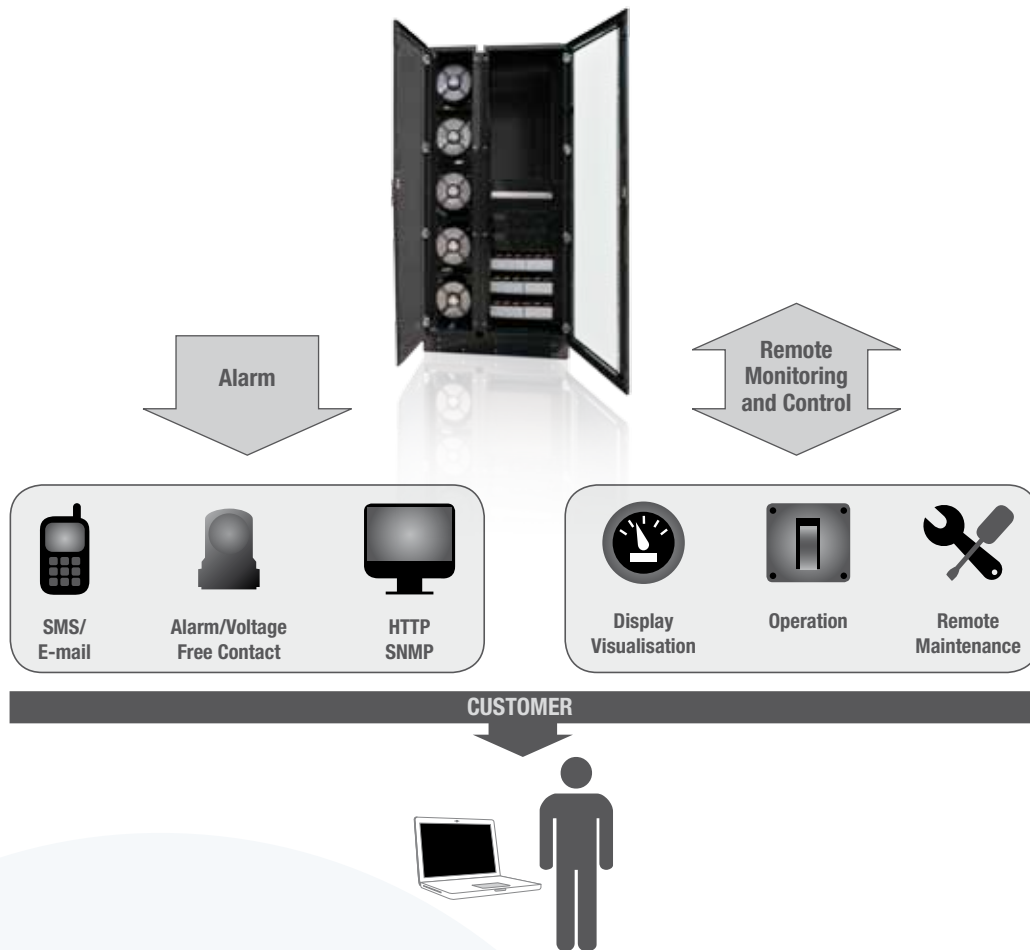
It includes a numerical keypad as well as the data memory and the controller unit for the storage and evaluation of the input. It is possible to connect up to two handles that will be controlled by one master handle.



MUST^{AC}

CONNECTIVITY

G-TEC intelligent solutions for networking allow continuous and assistant monitoring for the MUST AC system.



MUST^{AC} can provide remote information using different ways. The user can get the status through mobile phone, SMS, PDA (personal digital assistant) and internet connections. It is possible to have a display of functional parameters and also an operational control.

