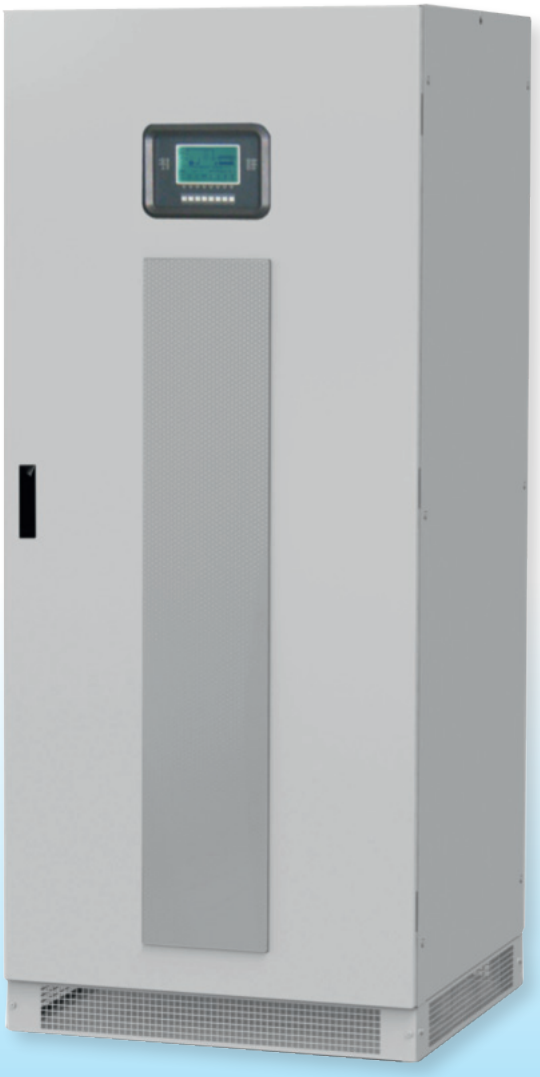
LEVER
power solutions

VEGA UPS Series

VM 10-100kVA 3/1
VT 10-200kVA 3/3
VT-HP 100-600kVA 3/3
With transformer isolated inverter



High Efficiency and Reliable Power Protection for:

- Datacenter and IT Systems
- Industrial Applications
- Medical, diagnostic and test devices
- Bank and Finance applications
- Chemical and Manufacturing process
- Emergency care systems for building

Optimal protection with highest efficiency

LEVER VEGA Series UPS is the top line in the power quality solutions for mission critical applications, including datacenters, industrial processes, building and medical emergency systems. From scalability to redundancy, from user-friendliness to maintainability, from parallel to connectivity, and from investment protection to lower cost of ownership, whichever value you need, VEGA provides industry leading efficiency.
In fact has been carefully designed to deliver maximum Return On Investment (ROI) and MTBF ,with the quickest Mean Time To Repair (MTTR).
VEGA is an online double conversion UPS (VFI SS 111 – IEC EN 62040-3) with isolated inverter.
The VEGA Series range includes three-phase input and single-phase output versions from 10 to 100kVA with 6-Pulse thyristor rectifier (optional 12-Pulse for 60-80kVA) with and without optional input filter for harmonics-less distortion; from 10 to 200kVA three-phase input and output with 6-Pulse thyristor rectifier; from 100 to 600kVA three-phase input and output versions HP with IGBT Power Factor Correction rectifier.

Flexibility and dedicated solutions

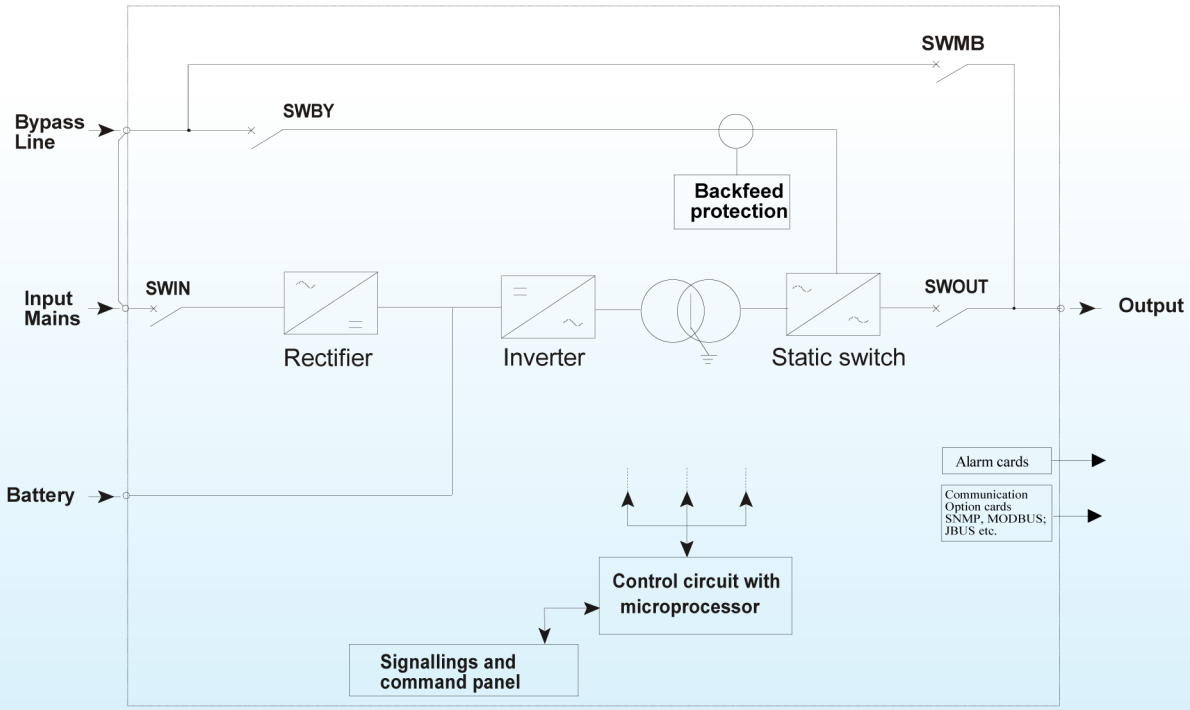
VEGA Series has a flexible control which allows several operational configuration as On-Line or Normal Mode, Ecomode, Smart Active, Stand-by, Frequency Converter and Voltage Stabilizer. A broad range of accessories and options, complex configurations and system architectures can be achieved to guarantee maximum power availability and the option to add new UPS without interruption to existing users. Using the LEVER UPS Group Synchronizer (UGS) and Parallel Systems Joiner (PSJ), sophisticated inter group parallel and redundant systems can be achieved to provide the highest possible levels of resilience and availability.
VEGA UPS can be adapted to meet the most specific requirements. Contact LEVER offices to discuss customized or dedicated solutions for your site.

Inverter with transformer: full galvanic isolation

The output isolation transformer on the inverter, inside the UPS cabinet, provides galvanic isolation for the critical load improving versatility in system application:

- Galvanic isolation for medical loads and special infrastructure;
- Two truly separate network inputs (main and emergency), coming from two different sources (with different neutrals); this is particularly well suited to parallel system in order to ensure selectivity between either sources, thus improving the reliability of the entire installation;
- Installation in networks without neutral.

Typical VEGA UPS design includes as standard splitted input and bypass line, inverter with transformer for total isolation Input-Bypass-Output-Maintenance disconnectors, Backefeed protection for your network:



Maximum availability

Distributed or centralized parallel configuration of up to 8 units per redundant (N+1) or power parallel system. Parallel configurations between model with different power ratings are also possible.
Hot System Expansion (HSE): allows the addition of a further UPS into an existing system, without the need to switch off the working UPS or transfer them to bypass mode. This guarantees maximum load protection, even during maintenance and system expansion.
Efficiency Control System (ECS): a system to optimize the operating efficiency of parallel systems, according
Maximum levels of availability, even in the event of an interruption to the parallel bus cable: the system is 'FAULT TOLERANT'. It is not affected by connections cable faults and continues powering the load without disruption, signaling an alarm condition.

VEGA-HP: Zero Impact Source

The VEGA-HP Series features the added advantages of the Zero Impact Source formula offered by an IGBT-based rectifier. Such eliminates problems related with installation in networks with limited power capacity, where the UPS is supplied by a generator set or anywhere there compatibility problems with loads generating current harmonics. VEGA-HP has very low input Total Harmonic Distortion in current, less than 3% in all load conditions and input Power Factor 0.99, plus the start-up delay function to restart the rectifier when mains power is really restored. Such input features provide saving cost in installation because smaller circuit protections devices, smaller electrical infrastructure (as genset and transformer) and less wiring size.

Intelligent battery care: best battery performances

VEGA UPS battery care system consists of several features to optimize the battery performances and operating life, for example:

- Dual level charging to reduce the charging time.
- Deep discharging protection to reduce the ageing.
- Temperature compensation.
- Automatic and Manual Battery test.
- Charge blocking system to reduce electrolyte consumption.

VEGA can operate with Open Vented and VRLA, Gel, Ni-Cd batteries.

Advanced communications

- Advanced multi-platform communications for all operating systems and network environments : PowerShield monitoring and shutdown software included, with SNMP agent, for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X, Sun Solaris, Linux, Novell and other Unix operating systems (IBM AIX on RS6000 PowerPC, HP UNIX, SUN Solaris INTEL, SUN Solaris SPARC, SCO OpenServer 5, SCO UnixWare, Silicon Graphics IRIX, DEC UNIX, Compaq Tru64 UNIX, Digital UNIX, BSD UNIX, NCR Unix, FreeBSD UNIX, Open VMS).
- The UPS is provided with a cable for direct connection to a PC (Plug and Play).
- Compatible with TeleNetGuard for remote monitoring.
- Double RS232 serial port.
- Communications slot for network adapter installation; EPO contact (Emergency Power Off) for switching off the UPS by remote emergency button.
- Remote display panel with graphic display.

MODEL	VM010	VM015	VM020	VM030	VM040	VM060	VM080	VM100
Nominal Power (kVA)	10	15	20	30	40	60	80	100
Active Power (kVA)	9	13.5	18	27	36	54	72	90
INPUT								
Input Voltage to Rectifier	380/400/415 Vac 3-phase, 3-wire							
Input Voltage to Bypass	380/400/415 Vac 3-phase + N, 4-wire							
Permissible Input Voltage	400V +20% / - 25%							
Input Frequency	50 or 60 Hz							
Permissible Input Frequency	45 – 65 Hz							
Input THDI with input filter	< 5% at nominal voltage and full load							
Input Power Factor	> 0,9 with input filter at nominal voltage							
Flex Power Walk-In	0 – 120 sec (selectable)							
DC PARAMETERS								
Battery Type	VRLA (Valve Regulated Lead Acid), Wet, Ni-Cd							
Nominal battery Bus	384Vdc (Float Voltage: 432V)396Vdc (FV:446V							
End Cell Voltage	Selectable from 1.65 to 1.90 V/cell (for VRLA / Wet cells)							
DC Ripple Voltage	< 1% (RMS value)							
Temperature compensation	Available							
OUTPUT								
Inverter Type	IGBT-based Sinewave PWM controlled							
Output Voltage	220/230/240 Vac 1-phase + N, 2-wire							
Output Voltage Regulation	from 210Vac to 242Vac (phase to N)							
Output Frequency	50 or 60 Hz (Frequency Converter Mode selectable)							
Static Variation	± 1%							
Dynamic Variation	± 5%							
Output Frequency Regulation	± 0,05% (on battery mode)							
Voltage Distortion THDV	1% (typical), 2% (max)							
Crest Factor Load Capability	3:1 (compliant with IEC 62040-3)							
Speed of frequency variation	1 Hz/sec (settable from 0,1 to 3)							
Overload Conditions	110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute (% of Nominal Load)							
Short circuit Current	250% for 1 second in current limitation (% of Nominal Load)							
Inverter efficiency (%)	95%							
Voltage Displacement	120° ± 1° el (with 100% unbalanced load)							
SYSTEM PARAMETERS								
UPS Efficiency	up to 98% in ECOmode and Smart Active							
PHYSICAL PARAMETERS & STANDARDS								
Dimensions WxDxH (mm)	555x740x1400					800x740x1400		800x800 x1900
Weight without batteries (kgs)	200	220	230	270	302	440	500	580
Noise level at 1m	60 dBA			62 dBA				
Operating temperature	0 ÷ +40°C							
Relative humidity	< 95% non-condensing							
Altitude site	< 1000m without derating							
Colour	Light Grey 7035							
IP Rating	IP20 (further as request)							
Remote signals	Dry contact (as standard)							
Remote Controls	EPO and Bypass (as standard)							
Communications	Double RS232 port + 2 slots for communications interface							
Options for communication	SNMP Adapter, Centralized Monitoring Software, Thermal and Humidity sensors, J-Bus/ModBus, ProfiBus, Additional programmable contacts							
Standards	IEC 62040-3, IEC 62040-2, IEC 62040-1-1, CE Mark; IEC 62040-1-1, EN 50091-2, EN 60950, EN 60529 and VFI 111							
Classification as IEC 62040-3	(Voltage Frequency Independent) VFI-SS-111							
Cable entrance	Bottom							
Moving the UPS	Transpallet							
Storage temperature	-25 ÷ +70°C							

MODEL	VT010	VT015	VT020	VT030	VT040	VT060	VT080
Nominal Power (kVA)	10	15	20	30	40	60	80
Active Power (kVA)	9	13.5	18	27	36	54	72
	INPUT						
Input Voltage to Rectifier	380/400/415 Vac 3-phase, 3-wire						
Input Voltage to Bypass	380/400/415 Vac 3-phase + N, 4-wire						
Permissible Input Voltage	400V +20% / - 25%						
Input Frequency	50 or 60 Hz						
Permissible Input Frequency	45 – 65 Hz						
Input THDI with 5th input filter	< 8% at nominal voltage and full load						
Input Power Factor	> 0,9 with input filter at nominal voltage						
Flex Power Walk-In	0 - 120 sec (selectable)						
	DC PARAMETERS						
Battery Type	VRLA (Valve Regulated Lead Acid), Wet, Ni-Cd						
Nominal battery Bus	384Vdc (Float Voltage: 432V)						
End Cell Voltage	Selectable from 1.65 to 1.90 V/cell (for VRLA / Wet cells)						
DC Ripple Voltage	< 1% (RMS value)						
Temperature compensation	Available						
	OUTPUT						
Inverter Type	IGBT-based Sinewave PWM controlled						
Output Voltage	380/400/415 Vac 3-phase + N, 4-wire						
Output Voltage Regulation	from 360Vac to 420Vac 3-phase						
Output Frequency	50 or 60 Hz (Frequency Converter Mode selectable)						
Static Variation	± 1%						
Dynamic Variation	± 5%						
Output Frequency Regulation	± 0,05% (on battery mode)						
Voltage Distortion THDV	1% (typical), 2% (max)						
Crest Factor Load Capability	3:1 (compliant with IEC 62040-3)						
Speed of frequency variation	1 Hz/sec (settable from 0,1 to 3)						
Overload Conditions	110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute (% of Nominal Load)						
Short circuit Current	250% for 1 second in current limitation (% of Nominal Load)						
Inverter efficiency (%)	95%						
Voltage Displacement	120° ± 1° el (with 100% unbalanced load)						
	SYSTEM PARAMETERS						
UPS Efficiency	up to 98% in ECOmode and Smart Active						
	PHYSICAL PARAMETERS & STANDARDS						
Dimensions WxDxH (mm)	555x740x1400					800x740x1400	
Weight without batteries (kgs)	228	241	256	315	335	460	540
Noise level at 1m	60 dBA				62 dBA		
Operating temperature	0 ÷ +40°C						
Relative humidity	< 95% non-condensing						
Altitude site	< 1000m without derating						
Colour	Light Grey 7035						
IP Rating	IP20 (further as request)						
Remote signals	Dry contact (as standard)						
Remote Controls	EPO and Bypass (as standard)						
Communications	Double RS232 port + 2 slots for communications interface						
Options for communication	SNMP Adapter, Centralized Monitoring Software, Thermal and Humidity sensors, J-Bus/ModBus, ProfiBus, Additional programmable contacts						
Standards	IEC 62040-3, IEC 62040-2, IEC 62040-1-1, CE Mark; IEC 62040-1-1, EN 50091-2, EN 60950, EN 60529 and VFI 111						
Classification as IEC 62040-3	(Voltage Frequency Independent) VFI-SS-111						
Cable entrance	Bottom						
Moving the UPS	Transpallet						
Storage temperature	-25 ÷ +70°C						

MODEL	VT100	VT120	VT160	VT200
Nominal Power (kVA)	100	120	160	200
Active Power (kVA)	90	108	144	180
	INPUT			
Input Voltage to Rectifier	380/400/415 Vac 3-phase, 3-wire			
Input Voltage to Bypass	380/400/415 Vac 3-phase + N, 4-wire			
Permissible Input Voltage	400V +20% / - 25%			
Input Frequency	50 or 60 Hz			
Permissible Input Frequency	45 – 65 Hz			
Input THDI with 5th input filter	< 10% at nominal voltage and full load			
Input Power Factor	> 0,9 with input filter at nominal voltage			
Flex Power Walk-In	0 – 120 sec (selectable)			
	DC PARAMETERS			
Battery Type	VRLA (Valve Regulated Lead Acid), Wet, Ni-Cd			
Nominal battery Bus	396Vdc (Float Voltage: 446V)			
End Cell Voltage	Selectable from 1.65 to 1.90 V/cell (for VRLA / Wet cells)			
DC Ripple Voltage	< 1% (RMS value)			
Temperature compensation	Available			
	OUTPUT			
Inverter Type	IGBT-based Sinewave PWM controlled			
Output Voltage	380/400/415 Vac 3-phase + N, 4-wire			
Output Voltage Regulation	from -8% to +10%			
Output Frequency	50 or 60 Hz (Frequency Converter Mode selectable)			
Static Variation	± 1%			
Dynamic Variation	± 5%			
Output Frequency Regulation	± 0,05% (on battery mode)			
Voltage Distortion THDV	1% (typical), 2% (max)			
Crest Factor Load Capability	3:1 (compliant with IEC 62040-3)			
Speed of frequency variation	1 Hz/sec (settable from 0,1 to 3)			
Overload Conditions	110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute (% of Nominal Load)			
Short circuit Current	250% for 1 second in current limitation (% of Nominal Load)			
Inverter efficiency (%)	95%			
Voltage Displacement	120° ± 1° el (with 100% unbalanced load)			
	SYSTEM PARAMETERS			
UPS Efficiency	up to 98% in ECOmode and Smart Active			
	PHYSICAL PARAMETERS & STANDARDS			
Dimensions WxDxH (mm)	800x800x1900			
Weight (kgs)	600	610	690	790
Noise level at 1m	65 dBA	68 dBA		
Operating temperature	0 ÷ +40°C			
Relative humidity	< 95% non-condensing			
Altitude site	< 1000m without derating			
Colour	Light Grey 7035			
IP Rating	IP20 (further as request)			
Remote signals	Dry contact (as standard)			
Remote Controls	EPO and Bypass (as standard)			
Communications	Double RS232 port + 2 slots for communications interface			
Options for communication	SNMP Adapter, Centralized Monitoring Software, Thermal and Humidity sensors, J-Bus/ModBus, ProfiBus, Additional programmable contacts			
Standards	IEC 62040-3, IEC 62040-2, IEC 62040-1-1, CE Mark; IEC 62040-1-1, EN 50091-2, EN 60950, EN 60529 and VFI 111			
Classification as IEC 62040-3	(Voltage Frequency Independent) VFI-SS-111			
Cable entrance	Bottom			
Moving the UPS	Transpallet			
Storage temperature	-25 ÷ +70°C			

MODEL	VT100 HP	VT120 HP	VT160 HP	VT200 HP	VT250 HP	VT300 HP	VT400 HP	VT500 HP	VT600 HP
Nominal Power (kVA)	100	120	160	200	250	300	400	500	600
Active Power (kVA)	90	108	144	180	225	270	360	450	540
INPUT									
Input Voltage to Rectifier	380/400/415 Vac 3-phase + N, 4-wire								
Input Voltage to Bypass	380/400/415 Vac 3-phase + N, 4-wire								
Permissible Input Voltage	400V +20% / - 25%								
Input Frequency	50 or 60 Hz								
Permissible Input Frequency	45 – 65 Hz								
Input THDI	< 3%								
Input Power Factor	> 0,99								
Flex Power Walk-In	0 – 120 sec (selectable)								
DC PARAMETERS									
Battery Type	VRLA (Valve Regulated Lead Acid), Wet, Ni-Cd								
Nominal battery Bus	480Vdc (Float Voltage: 540V)								
End Cell Voltage	Selectable from 1.65 to 1.90 V/cell (for VRLA / Wet cells)								
DC Ripple Voltage	< 1% (RMS value)								
Temperature compensation	Available								
OUTPUT									
Inverter Type	IGBT-based Sinewave PWM controlled								
Output Voltage	380/400/415 Vac 3-phase + N, 4-wire								
Output Voltage Regulation	from -8% to +10%								
Output Frequency	50 or 60 Hz (Frequency Converter Mode selectable)								
Static Variation	± 1%								
Dynamic Variation	± 5%								
Output Frequency Regulation	± 0,05% (on battery mode)								
Voltage Distortion THDV	1% (typical), 2% (max)								
Crest Factor Load Capability	3:1 (compliant with IEC 62040-3)								
Speed of frequency variation	1 Hz/sec (settable from 0,1 to 3)								
Overload Conditions	110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute (% of Nominal Load)								
Short circuit Current	250% for 1 second in current limitation (% of Nominal Load)								
Inverter efficiency (%)	95%								
Voltage Displacement	120° ± 1° el (with 100% unbalanced load)								
SYSTEM PARAMETERS									
UPS Efficiency	up to 98% in ECOmode and Smart Active								
PHYSICAL PARAMETERS & STANDARDS									
Dimensions WxDxH (mm)	800x850x1900		1000x850x1900			1500x1000x1900		2100x1000x1900	
Weight (kgs)	656	700	800	910	1000	1400	1700	2100	2400
Noise level at 1m	63-68 dBA					70-72 dBA			
Operating temperature	0 ÷ +40°C								
Relative humidity	< 95% non-condensing								
Altitude site	< 1000m without derating								
Colour	Light Grey 7035								
IP Rating	IP20 (further as request)								
Remote signals	Dry contact (as standard)								
Remote Controls	EPO and Bypass (as standard)								
Communications	Double RS232 port + 2 slots for communications interface								
Options for communication	SNMP Adapter, Centralized Monitoring Software, Thermal and Humidity sensors, J-Bus/ModBus, ProfiBus, Additional programmable contacts								
Standards	IEC 62040-3, IEC 62040-2, IEC 62040-1-1, CE Mark; IEC 62040-1-1, EN 50091-2, EN 60950, EN 60529 and VFI 111								
Classification as IEC 62040-3	(Voltage Frequency Independent) VFI-SS-111								
Cable entrance	Bottom								
Moving the UPS	Transpallet								
Storage temperature	-25 ÷ +70°C								

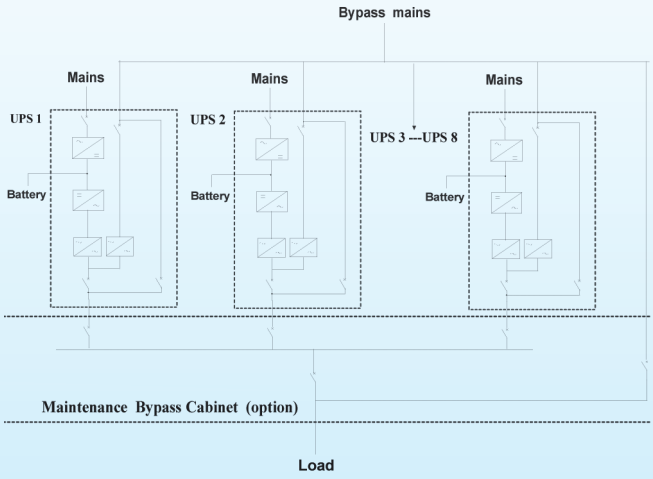
Note: The VEGA HP version is also available for American Standard 480V 60Hz with UL certificate.

Redundant configurations

VEGA Series is designed to include numerous useful optional configuration for redundancy in case of very critical loads.
The top 4 are listed below:

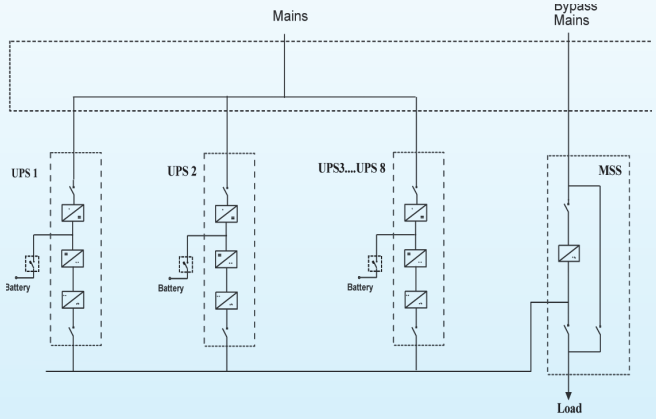
Parallel configuration up to 8 units with distributed bypass

Parallel architecture to ensure redundancy of the power source, adding an optional parallel kit for each UPS.
+ Flexibility and modularity and no single point of failure.



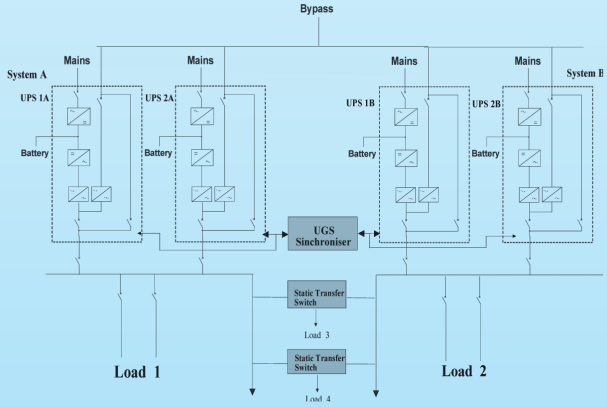
Parallel configuration up to 8 units with common bypass

Parallel architecture to ensure redundancy of the power source, with autonomous static and maintenance bypass management.
+ Selectivity of downstream faults in bypass mode.



Dynamic dual bus configuration

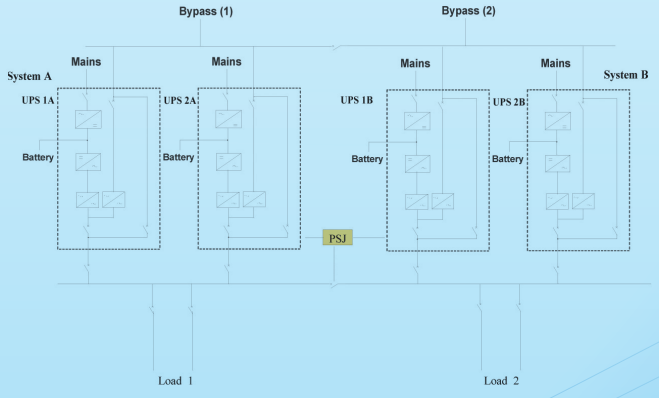
Solution to ensure redundancy up to the distribution of the power supply to the loads and improved STS operation.
+ Downstream fault discrimination.



UPS Group Synchronizer (UGS) allows two or more non-parallel UPS devices to remain synchronized even during mains power failure. The UGS also enables a LEVER UPS to be synchronized with another source that is independent and with a different power rating.

Dual bus system configuration

Solution to ensure redundancy of the power supply even during maintenance. **+ High availability and redundancy.**



Parallel Systems Joiner (PSJ) allows two groups of UPS in parallel whilst operating, in the event of maintenance (with no interruption to the output), using a power coupling switch. Should one of the UPS in one of the parallel groups fail, it is automatically excluded. The PSJ connects the remaining UPS, to the other parallel group via an external bypass, in order to continue to guarantee load redundancy.

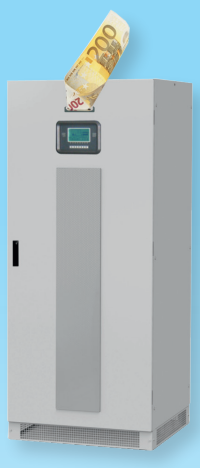
Energy Cost Saving with the Smart Active operating mode

The LEVER UPS work as quality power providers and protections for critical application, within such environments, energy management is crucial matter. The running costs must be minimized without compromising resilience, i.e. the ability to adapt to adverse external conditions whilst ensuring the complete availability of the services provided. Equipment must operate at the highest possible levels of efficiency to reduce the strain on critical power supplies and minimize the effect on the installation area. LEVER standard UPS models have always been compliant with the highest levels of efficiency in terms of energy protection and are classified according to a scale with 6 levels, corresponding with the efficiency value of the UPS with respect to the European Code of Conduct; this is known as the Eco Energy Level. The 6 levels have recently been updated to comply with the stringent new efficiency levels that the CoC requires for 2013-2014. In addition to this, the availability of the Smart Mode provides a further method for increasing efficiency, improving the Eco Energy Levels assessment. SMART MODE operating is an intelligent system able to switch the UPS in ECOmode (efficiency 98%) when the input mains is reliable and stable, transferring the UPS in On-Line mode in case mains parameters become without the ranges. While the mains returns within the right range for longer the UPS will be switch on ECOmode again.

Direct and Indirect cost effect

The direct cost effect are easily estimated comparing with a double conversion running at typical efficiency of around 93% at full load (92% at 50% of load), annual savings on the UPS can be considerable. ***For example at 0,15 €/kWh rate, for 100kVA UPS working at 50% load the saving is at least 3.500 €/year in almost stable network condition.***

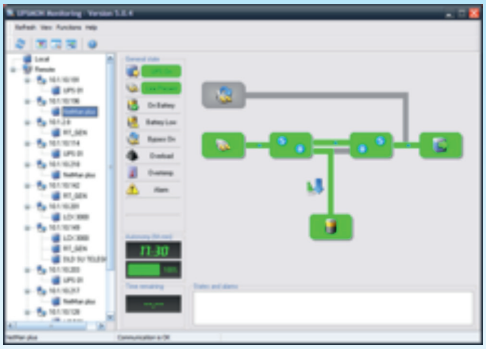
There are several indirect effects in better efficiency performance, basically are infrastructure investments and own running cost. For example the UPS is kept in an air conditioned room. The heat losses from the UPS must be compensated for by air cooler, which further increases electricity consumption. Therefore, UPS efficiency affects the degree of air conditioning system in rated capacity and power consumption. ***For example only for running cost the saving for the above system 100kVA at 50% load will be at least 1.300 €/year at 0,15 €/kWh.***



It mean the SMART MODE allows to recover the unit cost in few years only by savings in running cost.

Software and Connectivity

LEVER UPS provides several solutions for monitoring and computer management.



The PowerShield is the UPS monitoring software with Multilanguage support with Mutliserver shutdown also for cross-platform.

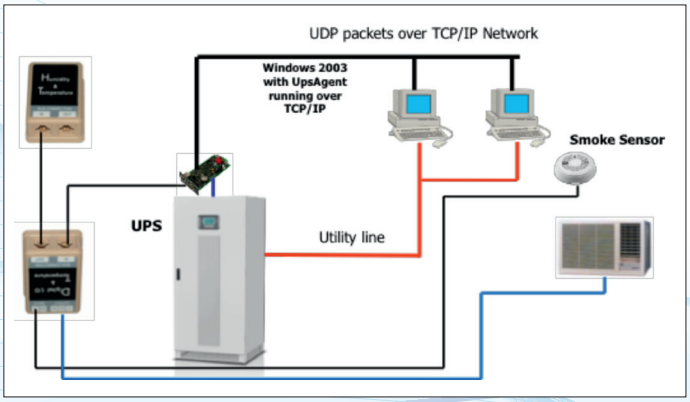
PowerShield³ STANDARD

- Version for Windows, Novell Netware, Linux and - MacOS X.
- Can control a single UPS (via RS232 or TCP/IP).
- Actions scheduling.
- Full events managing (by-pass, alarm, etc.).
- Emails support, modem calls to TeleNETGuard.
- SNMP agent included.

PowerShield³ FULL

- Version for all operating systems supported.
- Support up to 32 UPS (or parallel-redundant system).

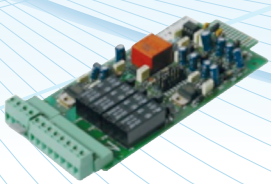
The SNMP agent has several parameter sensors (Temperature, Humidity, Digital Inputs etc.) providing the full solutions for the environment monitoring and control.



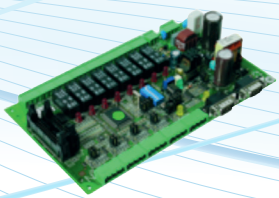
SNMP built in box and intellislot version

J-Bus/ModBus interface built in box and intellislot version

Remote Panel with LCD display



Alarms relays cards



Multi I/O (Input and Output)

Brochure VEGA – 16/05/2014 ENG

CE