Technical Data Sheet
Digital Energy™ LP 11
1 phase in / 1 phase out UPS 3-5-6-8-10 kVA

GENERAL DATA						
Nominal output rating	**kVA/kW**	**3/2.4**	**5/4**	**6/4.8**	**8/6.4**	**10/8**
Overall efficiency at nominal load	%	86	88	88	88	89
Heat dissipation at inverter nominal load PF=0.8 and charged battery	W	327	545	655	872	988
Cooling air (25°...30°C)	m^3/h	330 max				
Audible noise (load and temperature dependent)	dB(A)	40-50 (EN27779)				
Operating temperature range	-10°C to 40°C (15 to 25°C recommended for battery)					
Storage temperature range	-20°C to +45°C					
Relative humidity	Max. 95%, non-condensing					
Protection degree	IP 20 (IEC 529 and DIN 40050)					
Safety	EN 50091-1-1; EN 60950 / IEC 950					
EMC	EN 50091-2					
Surge capacity	IEC 1000-4-5 (6kV 1.2/50 µsec –3kA 8/20µsec)					
Electrostatic discharge immunity	4kV contact / 8kV air					
Transport	On pallet / rollers for installation					
Colour	Cubicle: RAL 9010 (white) Front panel: RAL 9006 (aluminum)					
Installation	Min. 10cm space for free air flow					
Access for maintenance	At front and on sides of the cabinet					
External cable connections	On terminals, bottom-rear					
Ventilation	Forced by regulated internal fans					

INPUT CONVERTER (Rectifier + Power Factor Correction)						
Nominal AC input voltage	220 – 240V L + N					
Input frequency range	40-70 Hz					
Power factor/THD	≥ 0.99 / ≤ 10%					
Nominal input current (no charging, U_{in} = nominal)	A	12.1	19.8	23.7	31.6	39
Inrush current	None					
DC output voltage	380 V					

BATTERY CHARGER						
Battery charging characteristic	IU (DIN 41773) constant current charging until floating voltage, then constant voltage charging + boost charge					
DC input voltage range	350-450 V					
DC output voltage	162.5/177V (3kVA), 271/295.5V (5/6/8/10kVA)					
Output current limitation	Adc	2.0	2.0	2.0	3.0	3.0
Recharge time	1.5 to 3 hours for 80% capacity					

BATTERY DATA						
Battery type	Sealed and maintenance free (VRLA=Valve Regulated Lead Acid))					
Float voltage at 25°C	162.5/271V					
Number of 12V batteries (in standard version)	12x7Ah (3kVA) 20x7Ah (5/6kVA) 20x12Ah (8/10kVA)					
Standard backup time at nominal load PF=0.8	min.	10	10	8	11	8
Standard backup extensions	See table on page 4					

OUTPUT CONVERTER (Inverter)

Input voltage range	270 – 400V					
Nominal output power at PF=0.8	kVA	3	5	6	8	10
Nominal output power with resistive load	kW	2.4	4	4.8	6.4	8
Nominal AC output voltage	220/230/240V					
Output voltage tolerance						
- static resistive load	± 1%					
- dynamic mean deviation over half cycle (load step 0-100-0%)	± 2%					
- with measured non-linear load 2.5:1	± 2%					
- recovery time to ± 1%	10 ms					
Overload capability (battery operation)	110%: 20 min, 130%: 3.5 min. 150%: 2 min.					
Short-circuit current capability (240ms)	A	32	45	50	67	100
Output frequency	50 or 60Hz					
Output frequency tolerance	± 0,1%, unless synchronised with mains					
Frequency tracking range	± 2, 4, or 6% of nominal, selectable					
Output voltage waveform	Sinusoidal					
Max. phase shift difference input-output	7°					
Harmonic distortion with linear load	1% max.					
Harmonic distortion with non-linear load (EN 50091)	10% max with measured crest factor 2.5:1					
Power factor range	Any lagging or leading power factor is permitted within the specified rating to PF=0.5					
Crest factor handling capability of the non-linear load	5:1					
Output power derating temp.	Above 40°C: 5% per degree until 60°C					
Output power derating altitude	Up to 1000m no derating Above 1000m 12.5% per 1000m, max. 4000m					
Protection	Automatic shut down (or transfer to bypass if available) In case of: - low/high DC voltage - overtemperature - overload / short circuit Output protected against connection to the mains					
Short circuit clearance capability (selective)	20% In within 10 ms with MCB class B					
Inverter bridge	PWM and IGBT technology					

BYPASS

Primary components	Thyristor switch Synchronisation circuit inverter/bypass mains					
Bypass voltage limits	±10% of nominal					
Frequency tracking range	± 2%, 4% or 6% selectable					
Slew rate	1Hz/s or 5Hz/s, selectable					
Overload capability on bypass, 1 minute/10 minutes	Amps	27/18	45/30	65/45	73/60	90/75

INTERFACING

Potential free Contact Interface	Four open-collector contacts signalling following alarms: - bypass active - mains failure - battery low - general alarm
ComConnect port (on Delta 9 pin)	For serial communication
Input terminals for:	- Emergency Shutdown - Battery extension MCB alarm wiring

Note: all indicated values are typical. Variations may be found from one unit to another.

CONTROLS, SIGNALS, ALARMS

FRONT

Operation/Alarm	:	green/red LED
LCD screen	:	2 x 16 characters
Push-buttons	:	down / enter-reset / up
Buzzer (resettable)		

* = option

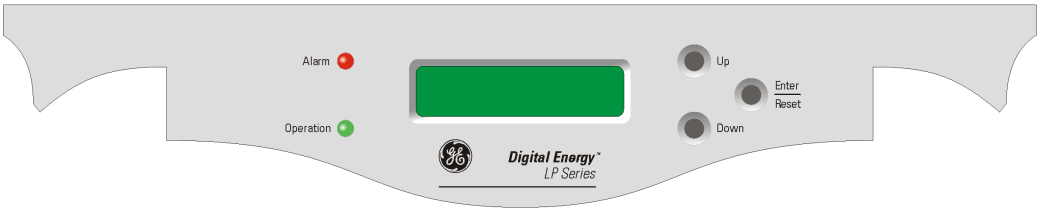
REAR

3 option slots for	:	RS232 interface card (std installed)
	:	Potentialfree contacts*
	:	SNMP*
	:	RPA* redundant parallel architecture

On/off switch
Manual bypass switch
Input/Output terminals
DC connector for external batteries (not for LP 3-11)
Line circuit breaker
Bypass circuit breaker

The LCD screen shows UPS system data, status messages, alarm messages, settings.

FRONT PANEL



OPTIONAL FEATURES

SNMP Interface Card
An SNMP interface card can be placed in the rear panel of the UPS, and allows the data interface to be connected directly to an Ethernet network.
When this option is installed the ComProt communication link (serial communication) is no longer available to the user.

Alarm Boxes
An *interface box* linked to the ComConnect port, the VIC/RELAYBOX/01 translates the ComConnect signals to five independent changeover contacts, with a maximum switching capacity of 230V/5A each.
Wall mounted plastic *alarm boxes* are available for remote audible and visual alarm indication.

Connectivity Products
A *splitter box* translates information from the ComConnect to several computers.
Interface kits (cables and/or software) are available for operating systems supporting JAVA and most commonly used network operating systems, including Novell, UNIX, VMS, Windows platforms, IBM AS/400, IBM OS/2, LINUX.
Please contact your dealer for specific information.

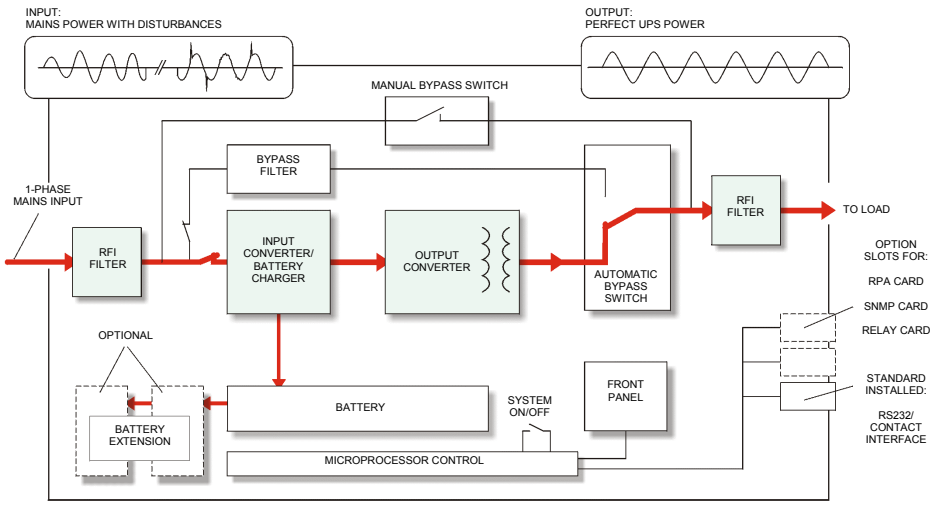
Battery Extension Packs
Except for the 3-11 model, the LP 11 UPS can be equipped with additional batteries to increase the runtime of the unit. These additional batteries are housed in a separate battery pack. Additional batteries will increase the recharging time for the unit. All other operational information is the same.
Battery packs can be connected in parallel to increase the runtime. DC connectors make installation of battery packs easy and simple.

Dimensions and battery table

UPS Model	Backup time (min.)	Total capacity (Ah)	Nr. of extra battery cabinets	Battery cabinet "VSDA 1"	UPS cabinet		
					Dimensions	UPS weight (*)	Shipping weight (*)
LP3-11	10	7	n.a.	n.a.	Cabinet: "VSD1" Dimensions (hxwxd): 537x313x590mm (height with wheels) Shipping dimensions: 800x460x750mm	85kg	100kg
LP5-11	10 *	7 *	-	Dimensions (hxwxd): 537x313x590mm Shipping dimensions (hxwxd): 800x460x750mm Battery: 240Vdc 7Ah or 14Ahr Weight with battery: 70kg or 120kg Shipping weight: 85kg or 135kg		110kg	125kg
	25	14	1				
	45	21	1				
	60	28	2				
	80	35	2				
LP6-11	8 *	7 *	-			115kg	130kg
	21	14 *	1				
	35	21	1				
	50	28	2				
	65	35	2				
LP8-11	11 *	12 *	-		Cabinet: "VSD2" Dimensions (hxwxd): 680x313x720mm (height with wheels) Shipping dimensions: 915x460x810mm	165kg	185kg
	22	19	1				
	33	26	12				
	44	33	2				
	55	40	2				
LP10-11	8 *	12 *	-			170kg	190kg
	16	19	1				
	25	26	1				
	34	33	2				
	43	40	2				

(*): Standard backup time and capacity

UPS Block Diagram



Recommended external fusing of input wiring		Cable sections input and output recommended by European standards / in ( ) SEV Alternatively, local standards to be respected	
UPS Model	Fuses gL / gG or Automatic Breakers	CABLE SECTIONS	
	Mains / Bypass input	mm^2	AWG
LP3-11	16A	4	12
LP5-11	25A	6	10
LP 6-11	25A	6	10
LP 8-11	50A	10	8
LP 10-11	50A	10	8