

GE  
Critical Power

# Technical Data Sheet

Uninterruptible Power Supply

*On-line VH Series UPS*

700 - 1000 - 1500 - 2000 - 3000 UL / 120V



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Model: **VH Series 700 – 1000 – 1500 - 2000 – 3000 VA UL / 120V**

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The illustrations and plans describing the equipment are intended as general reference only and are not necessarily complete in every detail.

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<b>GENERAL DATA</b>						
Topology	VFI, on line double conversion					
Model	VH	700	1000	1500	2000	3000
Nominal output rating	VA/W	700/630	1000/900	1500/1350	1920/1740	3000/2700
Overall efficiency at nominal load	%	>87				
Heat dissipation at inverter nominal load, PF=0.9 and charged battery	W	86	123	184	237	290
Cooling air (77°F ÷ 86°F)	CFM	15	21	32	41	51
Audible noise level at one meter	db(A)	<45 db(A), load and temperature dependent				
Operating temperature range	32°F ÷ 104°F (0°C ÷ +40°C) 59°F ÷ 77°F recommended for batteries					
Storage temperature range	-4°F ÷ 122°F (-20°C ÷ +50°C)					
Relative humidity max.	20-95% (non-condensing)					
Enclosure / Protection degree	Steel-plastic / IP 20					
Safety	UL 1778, 5 <sup>th</sup> Edition					
EMC	FCC Part-15, Class B					
Surge capacity	EN 61000-4-5: 6kV line-line / 6kV line-earth					
Electrostatic discharge immunity	EN 61000-4-2: 4kV contact / 15kV air discharge					
Transport	On pallet / Tower and rack mountable					
Colour	RAL 9005 (black)					
Outlet connectors	NEMA 5-20R (additional L5-20R in 2000VA and L5-30R in 3000VA)					
Inlet connectors	IEC	C13	C13	C19	C19	-
Cooling	Forced air					

<b>INPUT CONVERTER (RECTIFIER + POWER FACTOR CORRECTION)</b>						
Nominal AC input voltage	120V					
Input frequency range	45 ÷ 66 Hz					
Power factor	>0.99					
THDi	<6%					
Nominal input current (no charging, U <sub>in</sub> = nominal)	A	6.6	9.1	13.9	16	24
Inrush current	None					
DC Output voltage	2x210V					

<b>BATTERY CHARGER</b>						
Battery charging characteristic	Constant current until boost voltage, then float voltage					
AC input voltage range	60 to 140V					
DC output voltage	Vdc	40.5		81		
Output current limitation	Adc	1.5				
Recharge time	3 hours for 90% capacity, standard battery					

<b>BATTERY DATA</b>						
Battery type	Sealed lead acid, VRLA					
Float voltage at 25°C	Vdc	40.5		81		
Number & rating of 12V batteries (standard version)		3*7Ah	3*9Ah	6*7Ah	6*9Ah	6*9Ah
Standard backup time at nominal resistive load	min	8	8	7.2	8	8
End of discharging voltage (Vdc/cell)	Vdc	1.66				
Standard backup extensions (table 1 for backup time)		NO	YES	YES	YES	YES

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

<b>OUTPUT CONVERTER (INVERTER)</b>						
Input voltage range	Vdc	200-220				
Nominal output power at PF=0.9	VA	700	1000	1500	1920	3000
Nominal output power with resistive load	W	630	900	1350	1740	2700
Nominal AC output voltage	Vac	120				
Output voltage waveform	sine wave					
Output voltage tolerance						
- static resistive load	< 1%					
- dynamic mean deviation over half cycle	< 2% (load step 0-100-0%)					
- with measured non-linear load 2.5:1	< 2%					
- recovery time to $\pm 1\%$	2ms					
Overload capability (battery operation)	110% during 4 minutes, 150% during 2 seconds					
Short circuit current capability	2.1 x nominal current during approx. 200ms					
Output frequency	50/60 Hz auto selectable (default 60 Hz during cold start)					
Output frequency tolerance	$\pm 0.05\%$ nominal, unless synchronized with mains					
Frequency tracking range	$\pm 10\%$ default ( $\pm 2\%$ selectable)					
Max. phase shift difference input-output	< 1% typical (max. 7° during tracking frequency range)					
Harmonic distortion with linear load	< 1%					
Harmonic distortion with non-linear load	< 6%					
Power factor range	0.7 to 1 (lag & lead)					
Crest factor handling capability of non-linear load	Up to 3:1					
Output power derating altitude	Up to 1000m no derating Above 1000m 12.5% per 1000m, max. 4000m.					
Protection	Automatic transfer to bypass (if available) in case of: - internal circuit failure - over temperature - overload / short circuit Output protected against connection to the mains					
Inverter bridge	PWM and IGBT technology					
<b>BYPASS</b>						
Primary element	Static switch					
Bypass voltage limits	-15% to +10% of selected output voltage					
Frequency tracking range	$\pm 10\%$ default ( $\pm 2\%$ selectable) of selected output frequency					
Slew rate	2 Hz/sec.					
Overload capability on bypass	120% $\geq 3$ min., 150% $\geq 1$ min.					
<b>INTERFACING</b>						
Potential free contacts (optional)	Four change-over contacts signalling following alarms: - bypass active - mains failure - battery low - general alarm (programmable)					
Input terminals for	- Remote Power Off - Battery extension pack DC connector					

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

**CONTROLS, SIGNALS AND ALARMS**

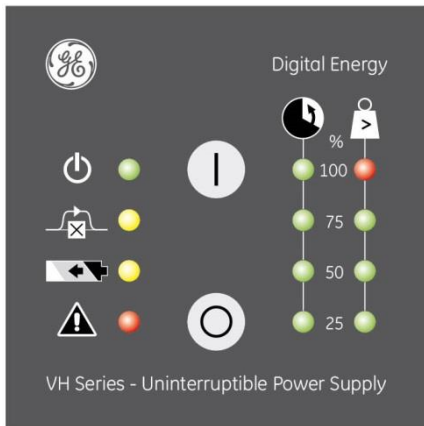
**Front panel details**

- On / Off push-buttons
- UPS ON / standby LED
- On Bypass LED
- On Battery LED
- Alarm LED (red)
- Runtime LED bar
- Load level LED bar

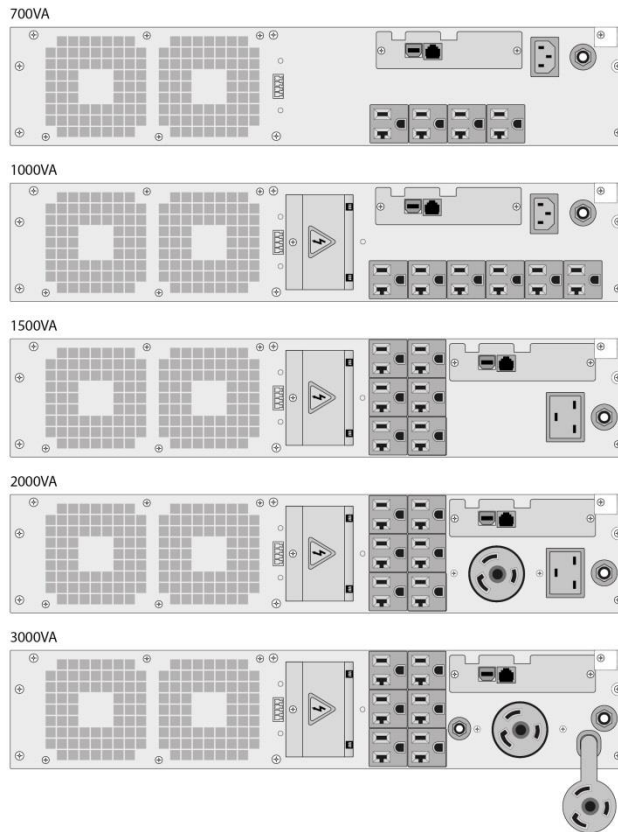
**Rear panel details**

- Input thermal circuit breaker
  - Input / Output sockets
  - DC connector for batteries (except VH700)
  - Remote External Power Off Contacts (REPO)
  - USB Interface Card
  - USB/RS232/Relay Card \*
  - SNMP Card \*
- \* option

**Front panel**



**Rear panels**



**OPTIONAL FEATURES**

**SNMP Interface card**

An SNMP interface adapter can be placed in the SNMP slot in the rear panel of the UPS, which allows the data interface to be connected directly to an Ethernet or Web.

**USB/RS232/Relay Card**

The card is provided with an USB connector, a 9-pole sub-D connector and four potential free changeover contacts, representing: mains failure, general alarm, battery low and bypass active.

**Battery modules – extended runtime**

Additional battery modules (up to 3) may be connected in parallel to in order to achieve a longer runtime. Every battery module is equipped with its DC cabling and it makes connection between modules very easy and simple.

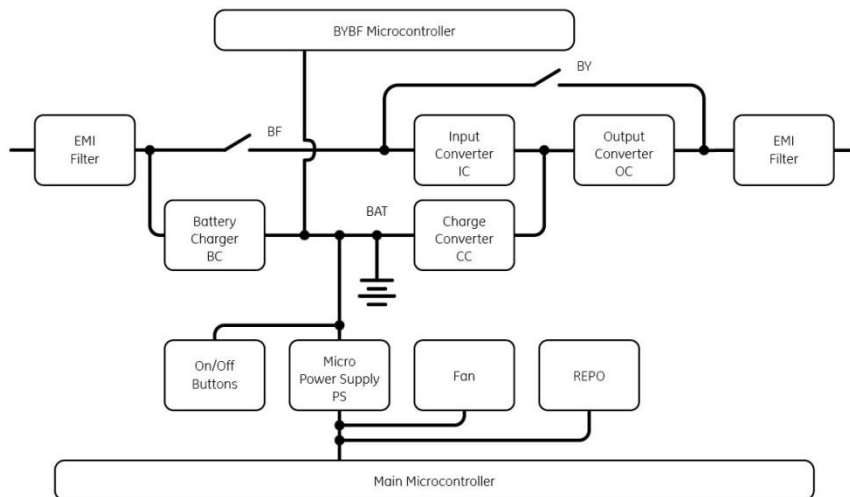
**Increasing of total battery capacity will correspond to a longer recharging time.**

**TECHNICAL DATA**

Table 1

UPS Model	Backup time (min.)	Total capacity (Ah)	No. of extra battery cabinets	Battery cabinet			UPS cabinet								
				Dimensions (HxWxD, inch/mm)	Weight lbs/kg	Shipping weight lbs/kg	Dimensions (HxWxD, inch/mm)	Weight lbs/kg	Shipping weight lbs/kg						
VH700	8	7	--	--				35/16	49/22						
VH1000	8	9	--	3.4x17.2x18.5 / 87x438x470	60/27	68/31	3.4x17.2x18.5 / 87x438x470	37/17	51/23						
	26	23	1												
	48	37	2												
	66	51	3												
VH1500	7	7	--	3.4x17.2x21.3 / 87x438x540	101/46	110/50	3.4x17.2x21.3 / 87x438x540	64/29	73/33						
	35	21	1												
	63	35	2												
	88	49	3												
VH2000	8	9	--				3.4x17.2x21.3 / 87x438x540	101/46	110/50	3.4x17.2x21.3 / 87x438x540	71/32	84/38			
	26	23	1												
	50	37	2												
	74	51	3												
VH3000	4	9	--							3.4x17.2x21.3 / 87x438x540	101/46	110/50	3.4x17.2x23.0 / 87x438x585	77/35	90/41
	15	23	1												
	25	37	2												
	50	51	3												

**UPS BLOCK DIAGRAM, PROTECTIONS AND CABLE SECTIONS**



Recommended external fusing of input wiring		Cable sections input and output recommended by NEC standards Alternatively, local standards to be respected	
UPS Model	Mains / Bypass input	CABLE SECTIONS (90°C insulation)	
		mm2	AWG
VH700	15A Class "B" MCB	2.08	14
VH1000	15A Class "B" MCB	2.6	13
VH1500	20A Class "B" MCB	4.17	11
VH2000	20A Class "B" MCB	5.26	10
VH3000	30A Class "B" MCB	8.37	8