

Technical Datasheet

PowerValue 11 RT 1-10 kVA

Classification IEC/EN 62040-3
VFI-SS-111

Working mode
on-line double conversion

Module power rating
1-10 kVA

Paralleling
up to 2 units (6-10 kVA)

Output power factor
0.9

Efficiency double conversion
up to 94%

Efficiency in ECO-MODE
up to 97%

Maximum weight w/out batteries
28.1 kg

Input current distortion THDi
<5 %

Input power factor (PF)
0.99

Communication cards
SNMP / relay card

Mechanical configuration
Rack-Tower with rotatable display

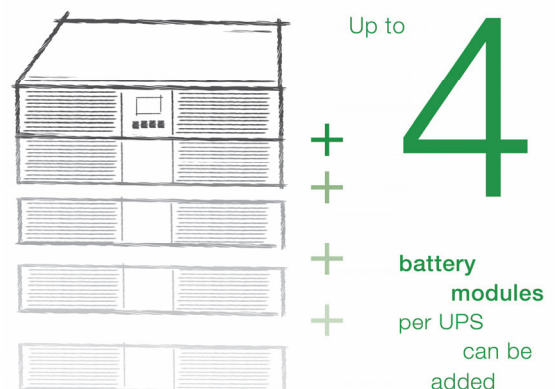
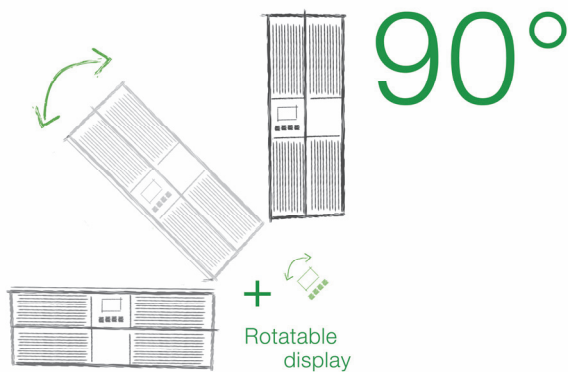


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UPS features

Frequency conversion

Operating as a frequency converter, PowerValue 11 RT not only converts the power supply frequency (50 Hz to/from 60Hz), but it also protects the load from power disturbances and guarantees additional battery power in case of mains failure.

The operation and installation is simple and implies in correctly wiring the UPS and in selecting the frequency conversion mode in the LCD display.

- Input frequency range: 40-70Hz
- Output frequency: 50 or 60 Hz
- Output de-rating:
PowerValue 11 RT 1-3kVA: 70%
PowerValue 11 RT 6-10kVA: 80%

Cold start

PowerValue 11 RT can be started without being connected to the mains power supply (start up from the batteries).

This feature is specially useful in the following situations:

- To help identify, during an unsuccessful system start-up, if the malfunction is on the power supply. Eg. If the UPS starts-up on battery and does not transfer to online or bypass mode, it is most probable that there is a mains failure.
- To start up and operate the unit even throughout a power outage.

Automatic load start-up

After a power outage, the UPS transfers to battery. If the batteries are completely discharged and the system shuts down, with the automatic load start up feature, the UPS will restart automatically once the mains power is recovered.

The operator can enable, disable or configure this function through the LCD panel according to the following options:

- UPS will charge the batteries and the inverter will start automatically (default)
- UPS will charge the batteries and start immediately on bypass. In this case, the operator has to start the inverter manually.
- UPS will charge the batteries and no output power will be seen

either on bypass or on inverter. In this case, the operator has to start the inverter manually.

Emergency power off (EPO)

Activating the emergency power off control of the UPS, the AC and the DC sources to the load are entirely disconnected.

Operation: To recover the UPS's normal status, the EPO connector has to be set back to its original configuration (Normally closed through a jumper in the UPS rear panel). After this, the EPO status has to be cleared through the LCD menu and the UPS will recover its operation in bypass-mode. To transfer the UPS to inverter-mode, the selection has to be made through the LCD display.

Fan speed control

The speed of PowerValue 11 RT fans vary with the load level and with the ambient temperature to minimize the power consumption while keeping

the UPS in a safe working temperature.

Wide input voltage and frequency range

With higher input tolerances, the UPS works longer on bypass or normal mode. This helps reducing the consumption of the batteries when there are small variations in the power supply.

Generator compatibility

Generators power are often routed through the UPS to supply power to the load during long power outages. The UPS acts as a power link that keeps critical systems operational until the generator synchronises with

the UPS and picks up the load. With PowerValue 11 RT, the power of the generator should be dimensioned 1.3 times the UPS rated power.

Paralleling

PowerValue 11 RT 6 and 10 kVA UPSs can be installed in parallel to increase the total system power or to add redundancy to the system.

The UPSs are delivered with an in-built parallel board and paralleling cables. No additional hardware is required for this installation.

Design flexibility

PowerValue 11 RT is extremely compact and is designed to be posi-

tioned in a tower format or rack-mounted. The display is rotatable and therefore easy adjustable to your configuration needs.

Increasing the runtime

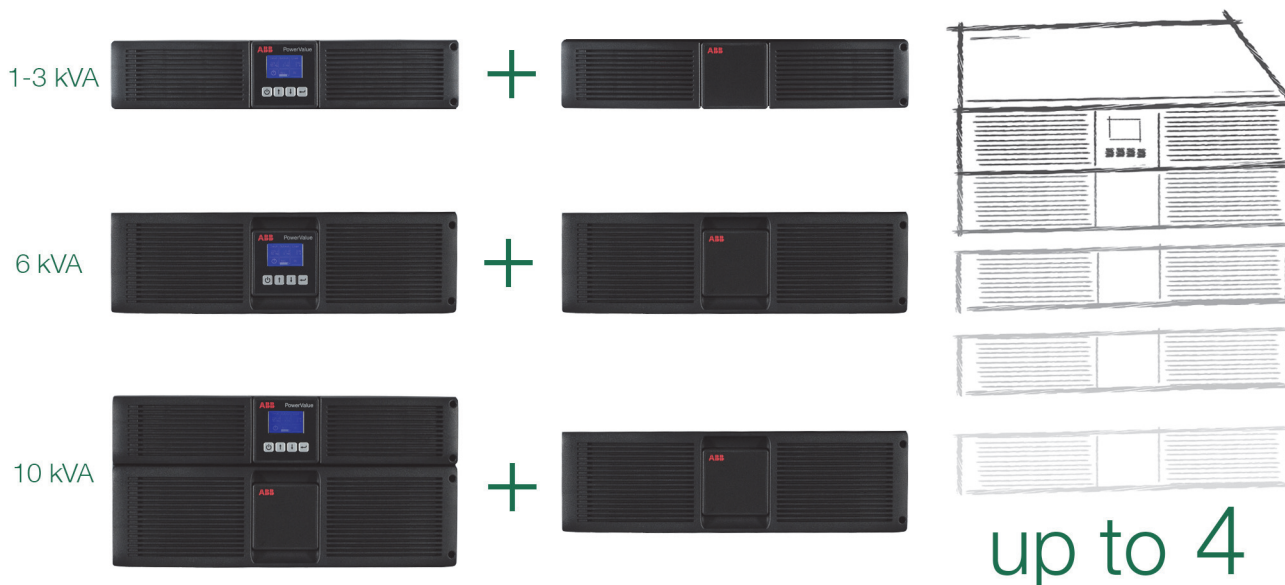
Battery modules are available to increase the system runtime.

The cables for connecting the battery modules to the UPS are integrated to the units and these can be easily plugged together to increase the system's runtime. To connect several battery modules to a group of UPSs in parallel, the battery modules should be firstly connected to each UPS. Only after this procedure is done, the UPSs should be connected in parallel.



Batteries

PowerValue can be configured with matching battery modules to satisfy extended runtime demands. Easily replaceable batteries increase availability and reduce Mean Time to Repair (MTTR).



UPS battery type



POWER (kVA)	Internal batteries	Charging current
1 kVA	1 x 3 x 7.2Ah	1.5 A
2 kVA	1 x 4 x 9Ah	1.5 A
3 kVA	1 x 6 x 9Ah	1.5 A
6 kVA	-	8 A
10 kVA	-	8 A

External battery type module



POWER (kVA)	Battery
1 kVA	(2 x 3) x 7.2Ah
2 kVA	(2 x 4) x 7.2Ah
3 kVA	(2 x 6) x 7.2Ah
6 kVA	(1 x 15) x 9Ah
10 kVA	(1 x 20) x 9Ah

Battery autonomy

POWER	1 KVA*	2 KVA*	3 KVA*	6 KVA*	10 KVA*
UPS internal batteries	<4 / 4 / 8 / 20	4 / 6 / 11 / 23	4 / 6 / 11 / 24	-	-
UPS + 1 batt module	16 / 24 / 40 / 85	12 / 18 / 29 / 66	13 / 19 / 31 / 69	6 / 9 / 16 / 35	5 / 7 / 13 / 28
UPS + 2 batt modules	32 / 48 / 76 / 170	22 / 31 / 54 / 115	23 / 33 / 56 / 120	16 / 22 / 36 / 82	13 / 18 / 29 / 67
UPS + 3 batt modules	52 / 71 / 119 / >180	32 / 49 / 78 / 174	35 / 51 / 82 / >180	26 / 36 / 59 / 119	20 / 29 / 47 / 103
UPS + 4 batt modules	68 / 97 / 166 / >180	45 / 63 / 105 / >180	49 / 67 / 111 / >180	36 / 51 / 84 / 167	29 / 41 / 68 / 138

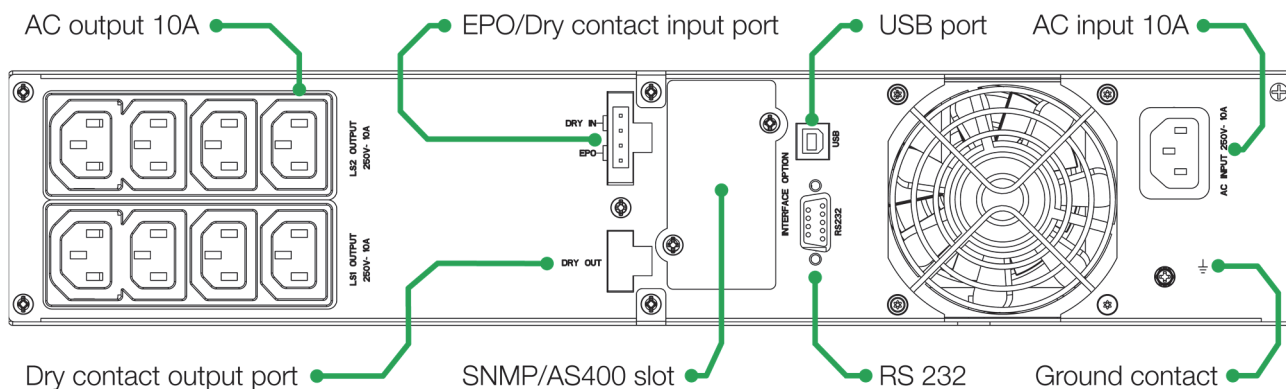
*Battery autonomy in minutes at 100 / 75 / 50 / 25% load

Given runtimes are estimates and valid at 20 degrees Celsius.

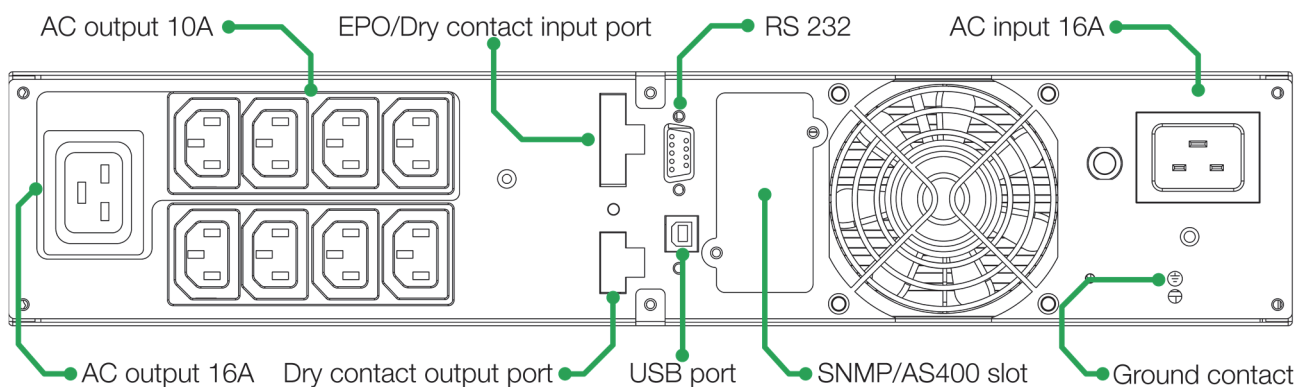
Actual runtime of the system will depend, among many variables, on the age of the batteries and environmental conditions

Rear view

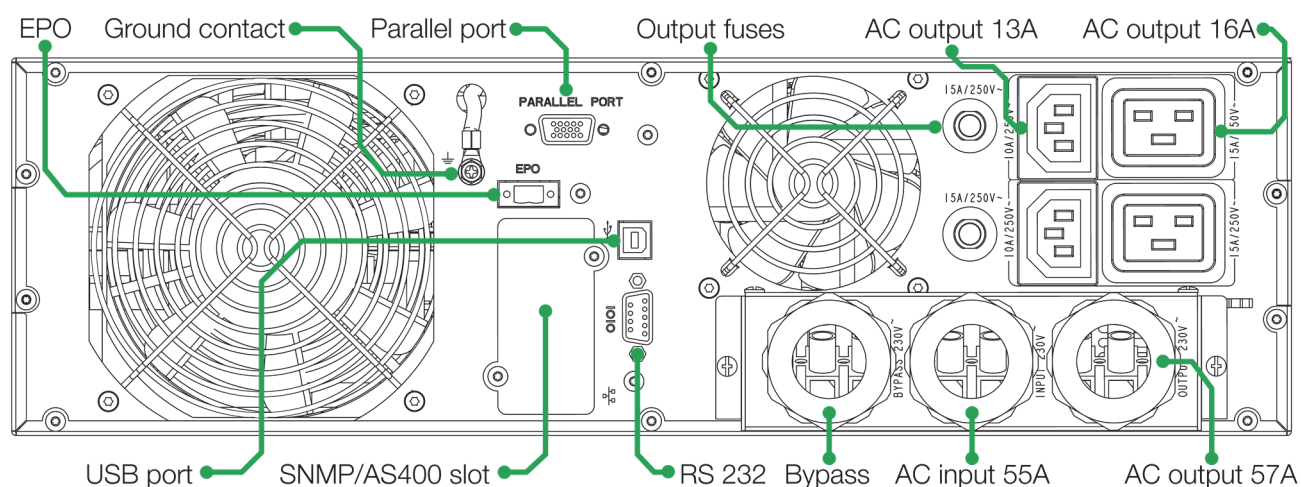
1-2 kVA



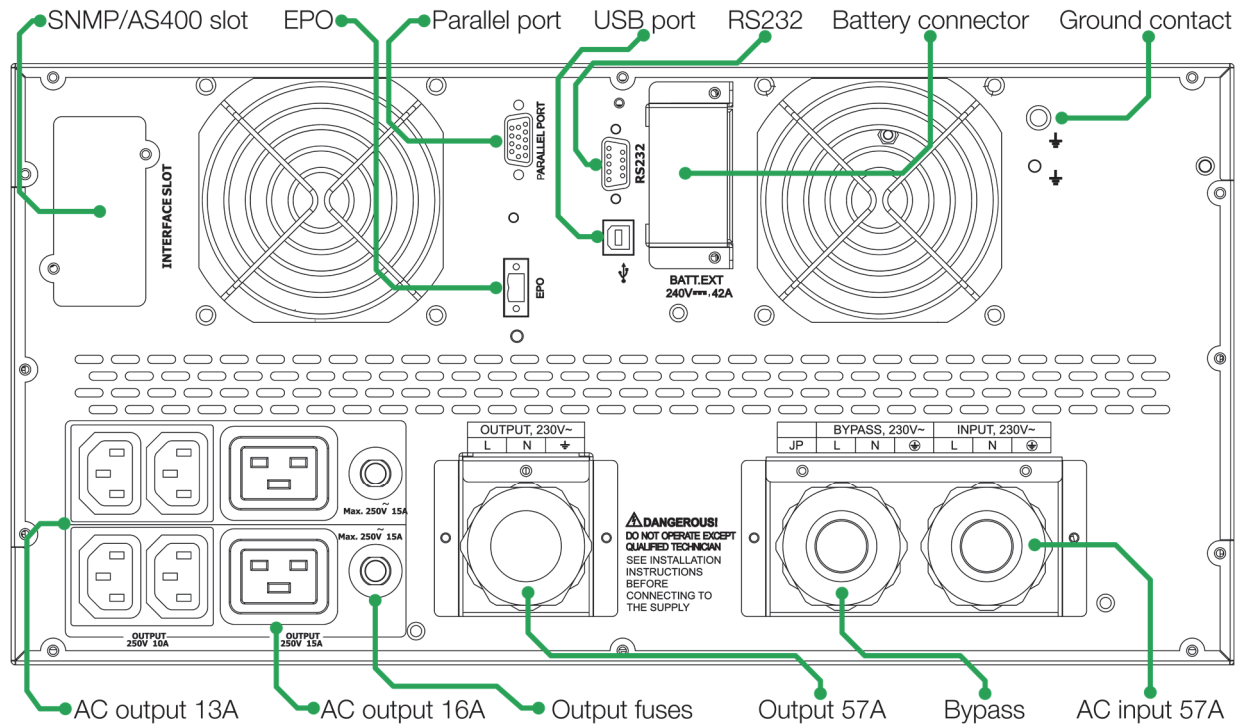
3 kVA



6 kVA



10 kVA



Connectors / Sockets

	Output socket					Input socket					Battery socket			
	Qty	Type	Current	Drawing		Qty	Type	Current	Drawing		Qty	Type	Current	Drawing
1-2 kVA	8	IEC-320C13	10 A			1	IEC-320C14	10 A			1	PP45	45 A	
3 kVA	8	IEC-320C13	10 A			1	IEC-320C20	16 A			1	PP45	45 A	
	1	IEC-320C19	16 A											
6 kVA	2	IEC-320C13	13 A			1	Terminals Cable gland	55 A			1	PP45	45 A	
	2	IEC-320C19	16 A											
	1	Terminals Cable gland	57 A											
10 kVA	4	IEC-320C13	13 A			1	Terminals Cable gland	57 A			1	PP45	45 A	
	2	IEC-320C19	16 A											
	1	Terminals Cable gland	57 A											

Options

Rack mounting kit

Rack rails, screws and metallic plates for easy installation of the UPS to a standard 19" rack.

Network interface card

Enables real-time monitoring of your UPS system via a standard web browser.

ABB's monitoring devices provide real-time visibility of the condition of your power equipment and help in solving problems before they become critical.

Models

- CS121 & CS141 slot / box Basic
- CS121 slot / box Advanced
- CS121 slot / box ModBus
- Winpower SNMP



Sensors

Temperature sensors, humidity sensors and alarm buzzers support monitoring the environmental condition and enables an efficient identification of the alarms.

Relay interface card

Provides contact closures for remote monitoring of alarm conditions of PowerValue 11 RT systems.

The card is user-installable, hot-swappable and enables advanced communication between the UPS and the computer

Models

- AS400

Maintenance bypass PDU 16 A (for PowerValue 11 RT 1-3 kVA only)

It provides maintenance bypass capability plus serves as an output Power Distribution Unit; it allows service continuity during UPS maintenance or upgrade with no load interruptions.



Technical specifications

GENERAL DATA		1 kVA	2 kVA	3 kVA	6 kVA	10 kVA
Photograph (front view with open doors)						
Apparent power		1 kVA	2 kVA	3 kVA	6 kVA	10 kVA
Active power		0.9 kW	1.8 kW	2.7 kW	5.4 kW	9 kW
UPS type		On-line, transformer-free				
Parallel capability		Up to 2 frames (6-10 kVA)				
Battery		Included (1-3kVA) / not included (6-10kVA)				
Performance classification		VFI-SS-111				
MECHANICAL						
Dimensions (width×height×depth) [mm]		438x86.5x436		438x86.5x608	438x129x594	438x215x594
Weight (with batteries)		16.2 kg	19.7 kg	28.6 kg	20.1 kg	28.1 kg
ACOUSTIC NOISE (acc. To IEC 62040-3)						
in normal mode (at <=25°C) at 100 / 50 % Load		<45 dBA	<50 dBA	<50 dBA	<55 dBA	<55 dBA
in battery mode (at <=25°C) at 100 / 50 % Load		<45 dBA	<50 dBA	<50 dBA	<55 dBA	<55 dBA
SAFETY						
Access		Operator				
Degree of protection against hazards and water ingress: IP 20						
ELECTROMAGNETIC COMPATIBILITY						
Compliant to IEC 62040-2						
Category Emission / Immunity		C1 (1-3kVA); C3(6-10KVA)				
ENVIRONMENTAL						
Storage temperature range		-15°C – +60°C				
Operative temperature range		0°C – +40°C				
Storage (models with batteries)		0°C – +35°C				
Relative humidity		≤ 95% (non-condensing)				
Max. altitude without de-rating		1000m (above 1000m, 1% de-rating every 100m according to IEC/EN 62040-3)				
ADDITIONAL AND USUAL INFORMATION						
Input connection		3 wires, 1 phase + N + PE				
Output connection		3 wires, 1 phase + N + PE				
Cable entry		Rear				
Battery cable entry		Front (1-6kVA) / rear (10kVA)				
Accessibility		Front only				
Air outlet		Back				
OPTIONS						
Battery cabinets						
SNMP cards						
Relay card with potential-free contacts (customer outputs)						
Maintenance bypass PDU 16A (1-3kVA)						
Rack mounting kits (1-3kVA / 6-10kVA)						
INCLUDED (DEFAULT)						
Parallel Kit (parallel board pre-installed, parallel cable provided with each unit)						
Single or dual input feed capability (6-10kVA) – No additional hardware needed						
Sea freight packaging (carton box)						
Back-feed protection		Internal (1-3kVA); See manual for 6-10kVA				

INPUT CHARACTERISTICS	1 kVA	2 kVA	3 kVA	6 kVA	10 kVA
Rated voltage (steady-state, r.m.s)	120-276 VAC (de-rating to 50% at 120V)				
Nominal voltage	208 VAC / 220 VAC / 230 VAC / 240 VAC				
Tolerance, referred to 230V	-23% / +20% at <100% load, -33% / +20% at <80% load, -43% / +20% at <60% load, -48% / +20% at <40% load				
Frequency, rated	50 Hz / 60 Hz (selectable)				
Frequency tolerance	45 Hz – 55 Hz (50 Hz system) / 54 Hz – 66 Hz (60 Hz system)				
Current (r.m.s), rated (with battery charged and input 230V)	4.5 A	9 A	13 A	26 A	45 A
Current (r.m.s), maximum (with charging batt. and input 230V)	5 A	9.5 A	14 A	33 A	52 A
Total harmonic distortion (THDi)	≤5% (IEC 61000-3-4)				
Power factor	0.99 @ 100% load				
Rated short-time withstand current (I _{cw})	3 kA for 1.5 cycles (1-3kVA) 6 kA for 1.5 cycles (6-10kVA)				

AC POWER DISTRIBUTION SYSTEM: TN-S AND TT

Phases required	1
Neutral required	Yes

ADDITIONAL AND USUAL INFORMATION

Connection	3 wires, 1 phase + N + PE
Cable entry	Rear
Walk In/Soft Start	Yes (Power supply needed only for first start-up)

OUTPUT CHARACTERISTICS	1 kVA	2 kVA	3 kVA	6 kVA	10 kVA
Rated power:	0.9 kW	1.8 kW	2.7 kW	5.4 kW	9 kW

AC POWER DISTRIBUTION SYSTEM: TN-S AND TT

Available phases	1
Neutral available	Yes
Rated voltage (steady state, r.m.s.)	208 / 220 / 230 / 240 VAC (no de-rating)
Variation in normal mode / battery mode	± 1%

TOTAL HARMONIC DISTORTION (THDU), 100% LOAD, NORMAL MODE:

Linear	< 2%
Non-linear (acc. to IEC 62040-3)	< 5%

TOTAL HARMONIC DISTORTION (THDU), 100% LOAD, BATTERY MODE:

Linear	< 2%
Non-linear (acc. to IEC 62040-3)	< 5%
Voltage unbalance and phase displacement, 100% load unbalance	N/A

VOLTAGE TRANSIENT AND RECOVERY TIME, 100% STEP LOAD:

Linear	20 ms
Non-linear (acc. to IEC 62040-3)	100 ms
Transfer normal mode --> battery mode	0 ms
Frequency (steady-state), rated	50 / 60 Hz (selectable)
Variation in normal mode (frq. Synchronized with mains)	± 10%

Variation in battery mode (free-running)	± 10%				
Max synch phase error (referred to a 360° cycle)	≤3°				
Max slew-rate	1 Hz/s				
Nominal current (In), r.m.s. rated	4.5 A	9 A	13 A	26 A	45 A
Overload on inverter	0.1 @150% load; 1.5 @125% load; 12 @110% load (1-3kVA) 0.1 @150%load; 30 @125%load; 120 @110%load (6-10kVA)				
Fault clearing capability normal mode and battery mode (100ms)	1.5 x In	1.5 x In	1.5 x In	1.5 x In	1.5 x In
Crest factor (Load supported)	3 : 1				
Load power factor, rated	0.9				
Displacement (permissible lead-lag range)	0.5 lead – 0.5 lag				
AC / AC EFFICIENCY IN NORMAL MODE, LINEAR LOAD:					
100% load	88.3%	89.6%	92.5%	90.9%	93.0%
75% load	87.7%	88.2%	91.6%	93.0%	94.6%
50% load	84.6%	86.5%	90.6%	93.5%	94.5%
25% load	76.2%	80.6%	88.8%	93.3%	94.4%
Eco-mode efficiency, linear load	≥95%	≥95%	≥95%	≥97%	≥97%
BYPASS—AUTOMATIC: STATIC SWITCH					
Transfer time: inverter à bypass / bypass à inverter / inverter à eco-mode / eco-mode à inv.	<4 ms / <4 ms / <4 ms / <10 ms				
Fault clearing capability (bypass mode) for 20 ms	26.6 x In ¹⁾ (120A)	22.2 x In ¹⁾ (200A)	15.3 x In ¹⁾ (200A)	15.3 x In ¹⁾ (400A)	13.3 x In ¹⁾ (600A)
Overload on bypass mode	Continuously @ <130% load 1 minute @ 130-180% load Immediate @ >180% load				
Bypass - maintenance	Yes, standard				
Bypass protection fuse or circuit breaker rating	External fusing according to section <i>Cables and Fuses</i>				

BATTERY CHARACTERISTICS	1 kVA	2 kVA	3 kVA	6 kVA	10 kVA
Technology	VRLA, vented lead-acid				
Number of 12 V blocks (fixed)	3	4	6	-	-
Battery charger max. current charger capability	1.5 A	1.5 A	1.5 A	8 A	8 A
Battery charger max. power charger capability	60 W	75 W	125 W	1440 W	1920 W
Floating voltage (VRLA)	2.275 VDC/cell				
End of discharge voltage (VRLA)	Load dependent ~1.6 VDC/cell				
r.m.s. ripple current (% of the battery capacity)	±1%				
Temperature compensation	Yes				
Battery test	Automatic and periodic battery test (selectable)				

1) With recommended fuses, see section *Cables and Fuses*

USER INTERFACE – COMMUNICATION

STANDARD ITEMS

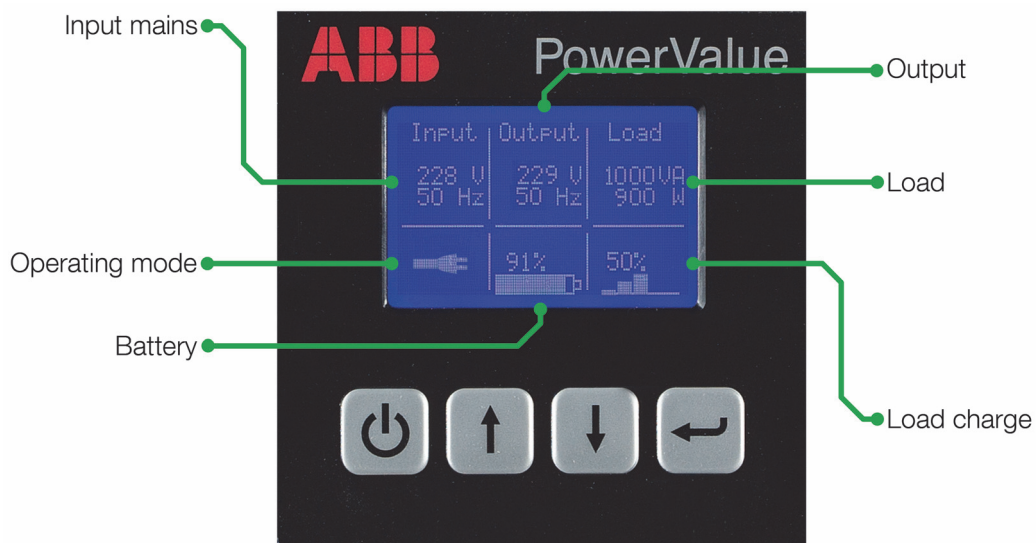
RS232 on Sub-D9 port	For service and for SNMP box
Input sockets	IEC 320 C13 (1-3kVA)
SNMP/AS400 slot	For integration of optional SNMP and relay card
Display	Dot matrix 128x64 LCD display

OPTIONAL ITEMS

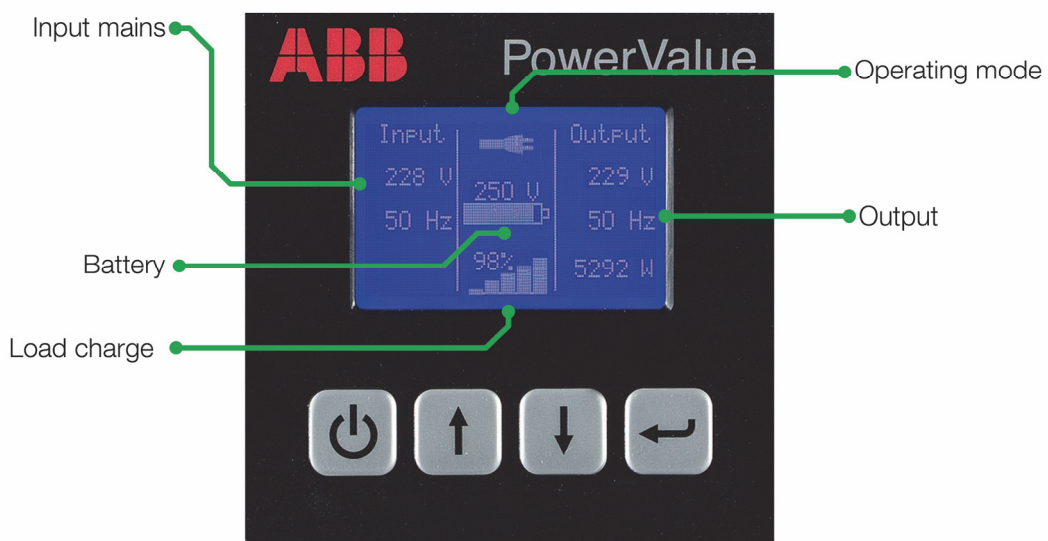
SNMP card	For monitoring and integration in network management
Relay card	For additional signal-monitoring and control

DISPLAY & MIMIC DIAGRAM

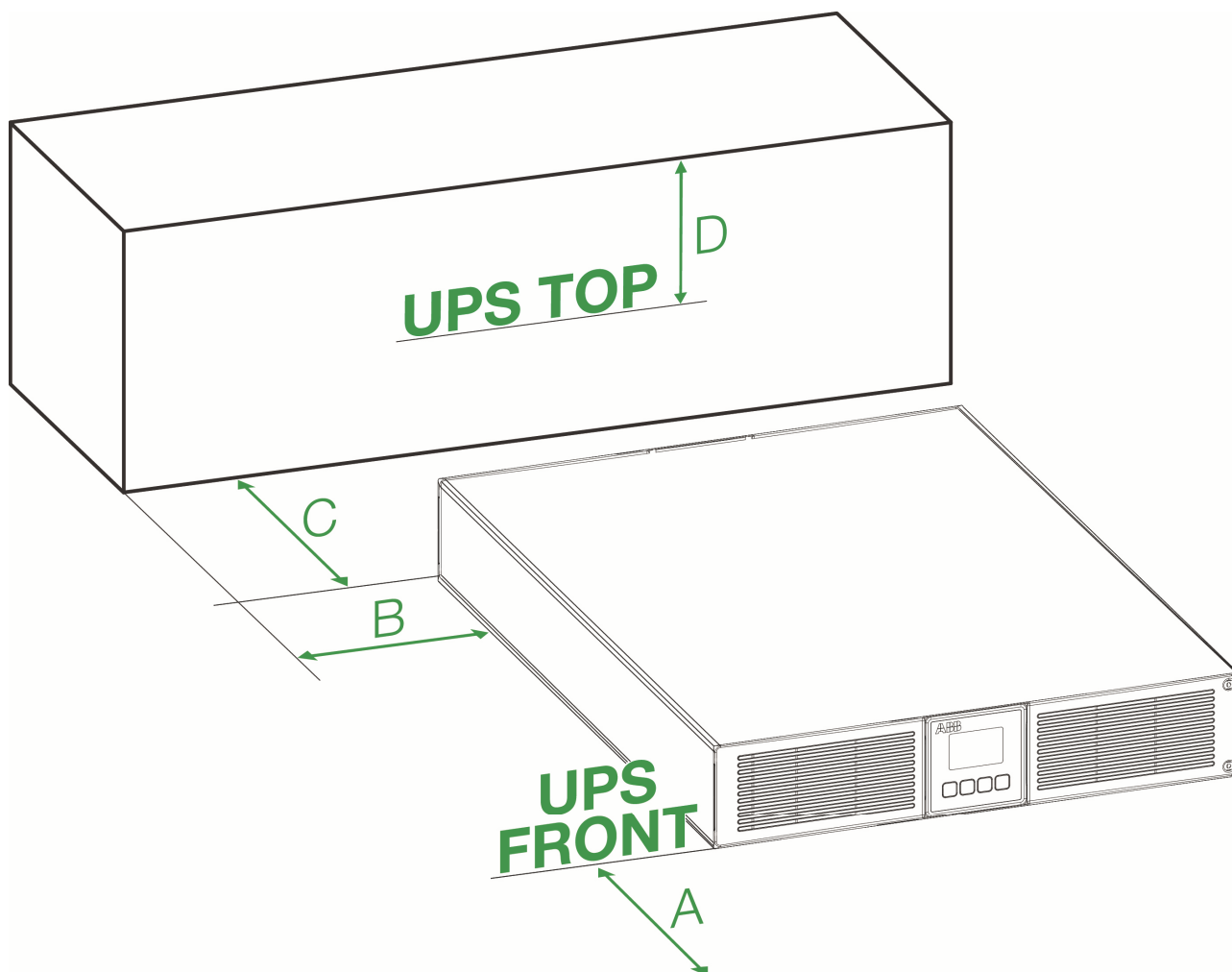
1-3 kVA



6-10 kVA



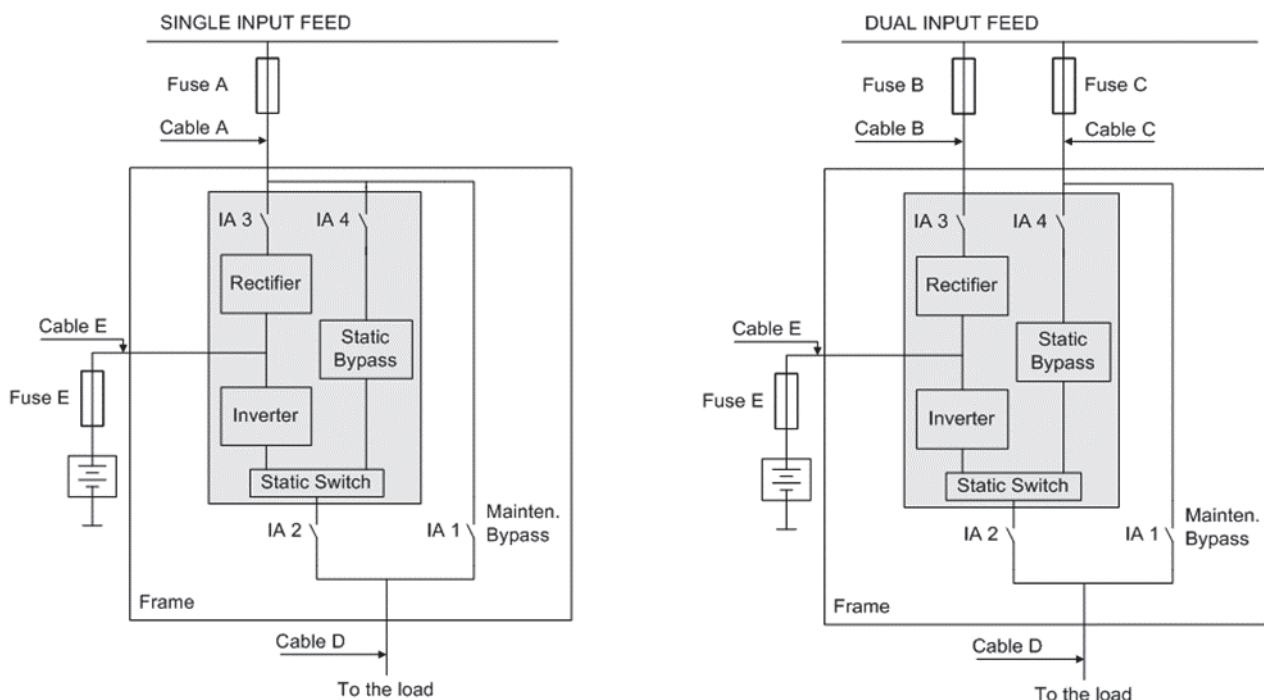
CLEARANCES	1 kVA	2 kVA	3 kVA	6 kVA	10 kVA
MINIMUM CLEARANCES FOR SINGLE UPS					
A	25 cm	25 cm	25 cm	50 cm	50 cm
B	0 cm	0 cm	0 cm	0 cm	0 cm
C	25 cm	25 cm	25 cm	50 cm	50 cm
D	0 cm	0 cm	0 cm	0 cm	0 cm
MINIMUM CLEARANCES FOR UPS PLUS OTHER CABINETS IN ROW					
A	25 cm	25 cm	25 cm	50 cm	50 cm
B	0 cm	0 cm	0 cm	0 cm	0 cm
C	25 cm	25 cm	25 cm	50 cm	50 cm
D	0 cm	0 cm	0 cm	0 cm	0 cm



HEAT DISSIPATION	1 kVA	2 kVA	3 kVA	6 kVA	10 kVA
Air-flow	From front to back				
Heat dissipation with 100% linear load	184.33 W	342.85 W	368.18 W	667.41 W	1000 W
Heat dissipation with 100% non-lin. load (acc. to 62040-3)	184.33 W	342.85 W	368.18 W	667.41 W	1000 W
Air-flow (25° - 30°) with 100% non-linear load	18.000 m³/h	34.285 m³/h	37.000 m³/h	75.000 m³/h	111.000 m³/h
Heat Dissipation without load	48 W	54 W	50 W	73 W	98 W

CABLE & FUSE

Cable sections and fuse ratings recommended according to (IEC 60950-1)



RATINGS	1 kVA	2 kVA	3 kVA	6 kVA	10 kVA
SINGLE INPUT FEED					
Input fuse A-Type: gL or CB	1 x 10 A	1 x 16 A	1 x 20 A	1 x 60 A	1 x 80 A
Input cable A	3 x 2.5 mm ²	3 x 2.5 mm ²	3 x 2.5 mm ²	3 x 10 mm ²	3 x 16 mm ²
Output cable D	3 x 2.5 mm ²	3 x 2.5 mm ²	3 x 2.5 mm ²	3 x 10 mm ²	3 x 16 mm ²
Battery fuse E-Type: gR or CB	2 x 32 A	2 x 50 A	2 x 50 A	2 x 60 A	2 x 80 A
Battery cable E	3 x 6 mm ²	3 x 10 mm ²	3 x 10 mm ²	3 x 10 mm ²	3 x 16 mm ²
DUAL INPUT FEED (STANDARD VERSION)					
Input fuse B-Type: gL or CB	1 x 10 A	1 x 16 A	1 x 20 A	1 x 60 A	1 x 80 A
Input Cable B	3 x 2.5 mm ²	3 x 2.5 mm ²	3 x 2.5 mm ²	3 x 10 mm ²	3 x 16 mm ²
Input fuse C-Type: gR or CB	1 x 10 A	1 x 16 A	1 x 20 A	1 x 60 A	1 x 80 A
Input cable C	3 x 2.5 mm ²	3 x 2.5 mm ²	3 x 2.5 mm ²	3 x 10 mm ²	3 x 16 mm ²
Output cable D	3 x 2.5 mm ²	3 x 2.5 mm ²	3 x 2.5 mm ²	3 x 10 mm ²	3 x 16 mm ²
Battery fuse E-Type: gR or CB	2 x 32 A	2 x 50 A	2 x 50 A	2 x 60 A	2 x 80 A
Battery cable E	3 x 6 mm ²	3 x 10 mm ²	3 x 10 mm ²	3 x 10 mm ²	3 x 16 mm ²

Revision history

Revision number	Chapter	Description	Date
141215	N/A	First release	15.12.2014
150309	Page 11	Corrected the "Fault clearing capability (bypass mode) for 20 ms" from: "Fault clearing capability (bypass mode) for 20 ms": 120A / 200A / 200A / 400A / 600A to: "Fault clearing capability (bypass mode) for 20 ms": 26.6xIn ¹⁾ (120A) / 22.2xIn ¹⁾ (200A) / 15.3xIn ¹⁾ (200A) / 15.3xIn ¹⁾ (400A) / 13.3xIn ¹⁾ (600A)	09.03.2015
151119	Page 7	Correct the name of the input socket for the 1-2kVA and 3kVA in the Connectors/Sockets chapter: Before: IEC-320C13 (1-2kVA) => After: IEC-320C14 (3kVA) Before: IEC-320C19 (1-2kVA) => After: IEC-320C20 (3kVA)	19.11.2015
REV-A	Page 5	Corrected the internal batteries values of the "UPS battery type" chapter.	19.07.2016
	Page 5	Corrected the battery value of the "External battery type module" chapter.	
	Page 5	Corrected the battery autonomies of the "Battery autonomy" chapter.	
	Page 8	Added the CS141 slot/box on the "Network interface card" chapter.	
	Page 8	Added the "Maintenance bypass PDU 16A" chapter.	
	Page 9	Added the Maintenance bypass PDU 16A (1-3kVA) row in the Option sub-chapter of the General Data main chapter.	
	Page 14	Corrected the dual input feed picture of the "cable & fuse" chapter.	
	Page 15	Added the revision history	
	Page 16	Removed the "Swiss quality" logo	

Contact us

www.abb.com/ups
ups.sales@ch.abb.com

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