Technical Datasheet

PowerValue 11/31 T
10-20 kVA

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

Working mode
on-line double conversion

Power rating
10-20 kVA

Paralleling
up to 4 units (up to 80 kVA)

Output power factor
0.9

Efficiency double conversion
up to 93%

Efficiency in ECO-MODE
up to 97%

Maximum weight w/out batteries
66.8 kg

Input current distortion THDI
<5 %

Input power factor (PF)
0.99

Communication cards
SNMP / relay card

Table of contents

UPS features

Frequency conversion

Operating as a frequency converter, PowerValue 11/31 T 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.
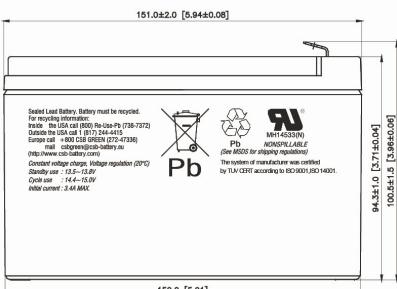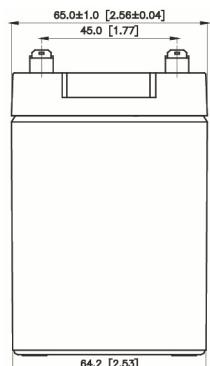
- Input frequency range: 40 - 70Hz
- Output frequency: 50 or 60 Hz
- Output de-rating:
  1-phase input: 60%
  3-phase input: no de-rating

Increasing the runtime

Battery cabinets are available to increase the system runtime. Each cabinet can host up to 96 batteries 9Ah and two configurations are possible: 2x24x9 Ah and 4x24x9Ah. Battery cabinets are dispatched empty, with links and trays. Batteries for both configurations are available separately (VLRA batteries of 9Ah).

To connect several battery cabinets to a group of UPSs in parallel, the battery cabinets should be firstly connected to each UPS. Only after this procedure, the UPSs should be connected in parallel.

Long backup models are available with 8A battery charger integrated in the UPS (no internal batteries).

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.

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.

Paralleling

PowerValue 11/31 T 10 and 20 kVA UPS can be installed in parallel to increase the total system power or to add redundancy to the system.

Batteries

PowerValue can be configured with matching battery cabinets to satisfy extended runtime demands. Easily accessible, and replaceable batteries increase availability and reduce Mean Time to Repair (MTTR).
The new battery cabinet is mechanically identical to the previous version but is can host double amount of batteries with flexible configuration: double autonomy in the same footprint.

Battery autonomy

Battery cabinet configuration	Battery configuration
A*	2 x 24 x 9 Ah
B**	4 x 24 x 9 Ah

|	UPS Internal Batteries	UPS + A*	UPS + B**	UPS + A* + B**	UPS + 2B**
10 kVA	-	69 / 30 / 18 / 12	151 / 69 / 42 / 30	262 / 109 / 69 / 49	380 / 151 / 96 / 69
10 kVA S	-	-	151 / 69 / 42 / 30	262 / 109 / 69 / 49	380 / 151 / 93 / 69
10 kVA B	29 / 12 / 6 / 4	109 / 49 / 29 / 21	208 / 87 / 55 / 39	302 / 130 / 82 / 58	442 / 176 / 109 / 79
10 kVA B2	69 / 30 / 18 / 12	151 / 69 / 42 / 30	262 / 109 / 69 / 49	380 / 151 / 93 / 69	651 / 208 / 122 / 87
20 kVA	-	29 / 12 / 6 / 4	69 / 29 / 18 / 12	69 / 49 / 29 / 21	151 / 69 / 42 / 29
20 kVA S	-	-	69 / 29 / 18 / 12	69 / 49 / 29 / 21	151 / 69 / 42 / 29
20 kVA B	29 / 12 / 6 / 4	69 / 29 / 18 / 12	69 / 49 / 29 / 21	151 / 69 / 42 / 29	208 / 97 / 55 / 39
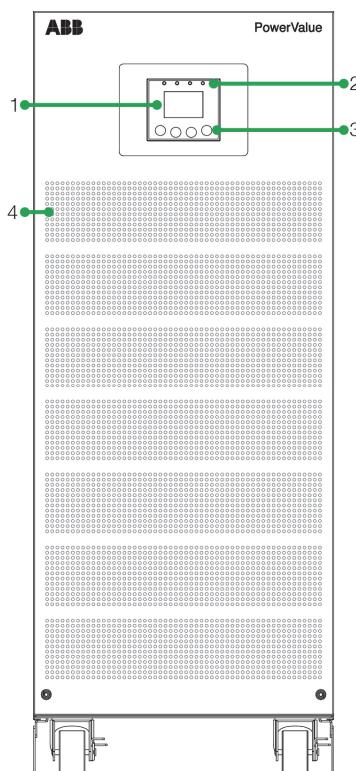
in minutes at 25 / 50 / 75 / 100% load

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
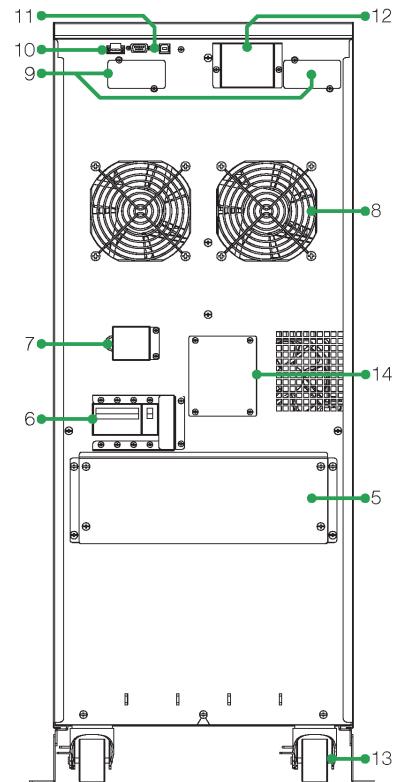
UPS devices
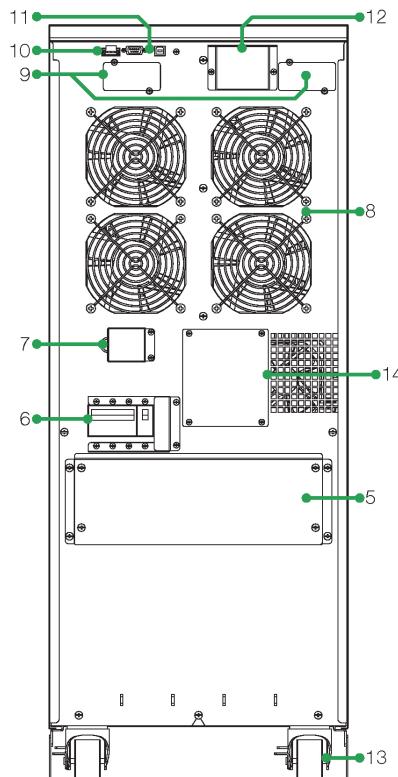
10 & 20 kVA - Front View

10 kVA - Rear View

20 kVA - Rear View

#	Device
1	LCD display
2	LEDs
3	Control keys
4	Ventilation inlets
5	Connection terminals
6	Input breaker
7	Back feed protection terminals
8	Fans
9	Network interface / AS400 slot
10	EPO contact
11	RS232 port / USB port
12	Parallel port
13	Wheels / support and brakes
14	Maintenance switch

Options
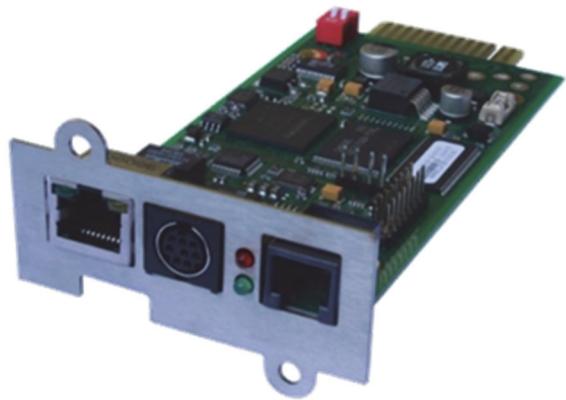
Network interface card

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

- CS141 Basic slot / box

- CS141 Advanced slot / box

- CS141 ModBus slot / box

- 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 11/31 T systems.
The card is user-installable, hot-swappable and enables advanced communication between the UPS and the computer.

Models

- AS400

Technical specifications

GENERAL DATA	10 kVA	20 kVA
Apparent power	10 kVA	20 kVA
Active power	9 kW	18 kW
UPS type	On-line, transformer-free	
Parallel capability	Up to 4 frames	
Battery	Models with or without batteries	
Performance classification	VFI-SS-111	
MECHANICAL		
Dimensions (width×height×depth)	350x890x715 mm	
Weight (without batteries)	56.3 kg / 65.0 kg (for S model)	66.8 kg / 68.0 (for S model)
Weight (with 1x24 x 9Ah batteries)	116.1 kg	-
Weight (with 2x24 x 9Ah batteries)	177.6 kg	190 kg
ACOUSTIC NOISE (acc. to IEC 62040-3)		
in normal mode (at <=25°C) at 100 / 50 % Load	<55 dBA	<55 dBA
in battery mode (at <=25°C) at 100% / 50% Load	<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	C3	
ENVIRONMENTAL		
Storage temperature range	-15°C – +50°C	
Operative temperature range	0°C – +45°C	
Relative humidity	≤ 95% (non-condensing)	
Max. altitude without de-rating	1000m	
ADDITIONAL AND USUAL INFORMATION		
Input connection	5 wires, 3 phase + N + PE or 3 wires, 1 phase + N + PE	
Output connection	3 wires, 1 phase + N + PE	
Cable entry	Rear	
Accessibility	Back and front (batteries)	
Air outlet	Back	
Color	Pantone process black C (PPC-48)	
OPTIONS		
Battery cabintes		
SNMP cards		
Relay card with potential-free contacts (customer outputs)		
INCLUDED (DEFAULT)		
Parallel Kit (parallel board pre-installed, parallel cable provided with each unit)		
Single or dual input feed kit (cables and metal plates)		
Sea freight packaging (carton box)		

INPUT CHARACTERISTICS	10 kVA	20 kVA
Rated voltage (steady-state, r.m.s)	1ph + N: 220 / 230 / 240 VAC 3ph + N: 380 / 400 / 415 VAC	
Frequency, rated	50 Hz / 60 Hz (selectable)	

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Frequency tolerance	± 10%	
Tolerance, referred to 230V	-23% / +20% at <100% load, -33% / +20% at <80% load, -43% / +20% at <60% load, -48% / +20% at <40% load	
Current (r.m.s), rated (with battery charged and input 400/230V)	42 A	84 A
Current (r.m.s), maximum (with charging batt. and input 400/230V)	48 A / 54 A (for S model)	90 A / 97 A (for S model)
Total harmonic distortion (THDi)	≤5% (IEC 61000-3-4)	
Power factor	0.99 @ 100% load	
Rated short-time withstand current (I_{cw})	2 kA (10 kVA) 4 kA (20 kVA)	

AC POWER DISTRIBUTION SYSTEM: TN-S AND TT

Phases required	3 or 1
Neutral required	Yes

ADDITIONAL AND USUAL INFORMATION

Connection	5 wires, 3 phase + N + PE or 3 wires, 1 phase + N + PE
Cable entry	Rear
Accessibility	Rear
Walk In/Soft Start	Yes (Power supply needed only for first start-up)

OUTPUT CHARACTERISTICS	10 kVA	20 kVA
Power, rated:	9000 W	18000 W

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 (90% de-rating at 200Vac)
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 un-balance	N/A

VOLTAGE TRANSIENT AND RECOVERY TIME, 100% STEP LOAD:

Linear	IEC 62040-3 Class 1
Non-linear (acc. to IEC 62040-3)	IEC 62040-3 Class 1
Transfer normal mode --> battery mode	0 ms
Frequency (steady-state), rated	50 / 60 Hz (selectable)
Variation in normal and battery mode	Max ± 10%
Variation in free-running	± 0.05 Hz
Max synch phase error (referred to a 360° cycle)	≤3°
Max slew-rate	1 Hz/s

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Nominal current (In, r.m.s. rated	42 A	84 A
Overload on inverter	30 sec @ 150% load 5 min @ 125% load 20 min @ 110% load	
Fault clearing capability normal mode and battery mode (100ms) [A]	1.5 x In	
Crest factor (Load supported)	3 : 1	
Load power factor, rated	0.9	
Displacement (permissible lead-lag range)	0.8 lead – 0.5 lag	

AC / AC EFFICIENCY IN NORMAL MODE, LINEAR LOAD:

100% load	93.1%	93.7%
75% load	92.7%	93.9%
50% load	91.6%	93.6%
25% load	87.6%	91.5%
Eco-mode efficiency, linear load	≥97	

BYPASS—AUTOMATIC: STATIC SWITCH

Transfer time: inverter => bypass / bypass => inverter / eco-mode => inverter	0 / 0 / 10 ms	
Fault clearing capability (bypass mode) for 20 ms	10 x In[1] (420)	10 x In[1] (840)
Overload on bypass mode	Continuously @ <130% load 1 minute @ >130% load	
Bypass - maintenance	Yes, standard	
Bypass protection fuse or circuit breaker rating	External fusing according to section *Cables and Fuses*	

BATTERY CHARACTERISTICS	10 kVA	20 kVA
Technology	VRLA, vented lead-acid	
Number of 12 V blocks (fixed)	24 (10 kVA B) / 48 (10 kVA B2)	48 (20 kVA B)
Battery charger max. current charger capability	4 A / 8 A (for S model)	4 A / 8 A (for S model)
Battery charger max. power charger capability	1.15 kW / 2.3 kW (for S model)	1.15 kW / 2.3 kW (for S model)
Floating voltage (VRLA)	2.28 VDC/cell	
End of discharge voltage (VRLA)	1.65 VDC	
R.m.s. ripple current (% of the battery capacity)	±2%	
Temperature compensation	Yes	
Battery test	Automatic and periodic battery test (selectable)	

1) With recommended fuses, see section Cables and Fuses

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STANDARD ITEMS
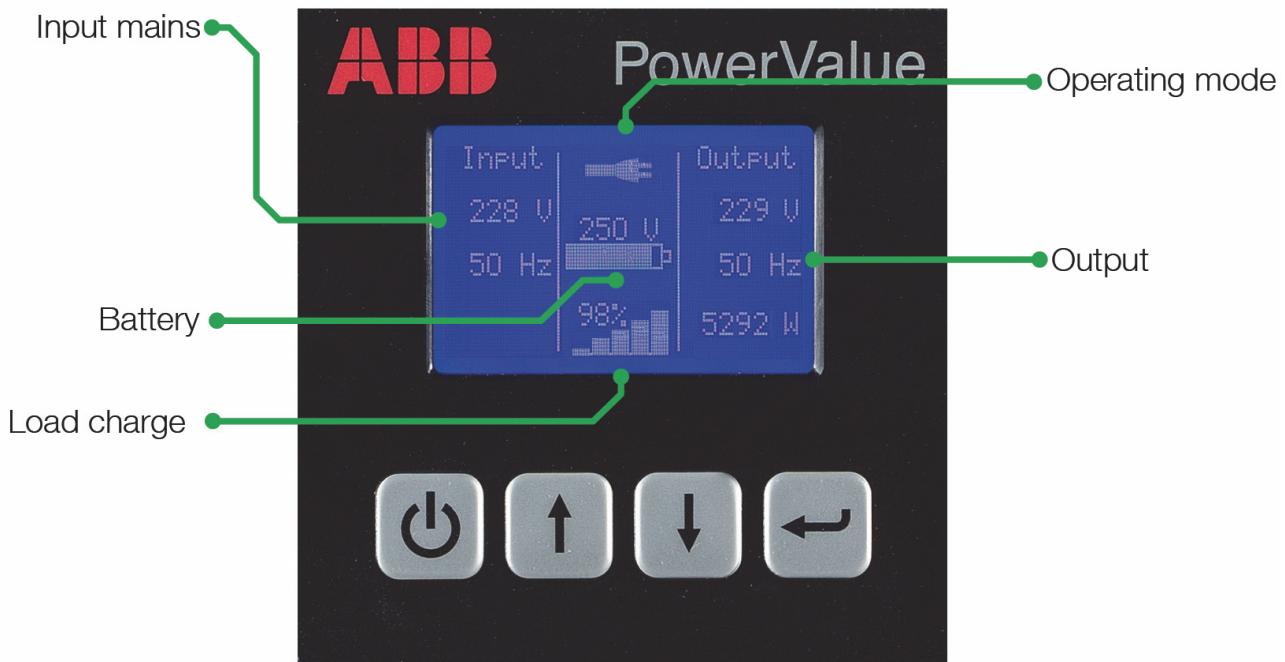
USB and RS232 on Sub-D9 port	For service and for SNMP box
Parallel port	Parallel board included
SNMP/AS400 slot	For integration of optional SNMP or relay cards
Display + LEDs	Dot matrix 128x64 LCD display + 4 LEDs

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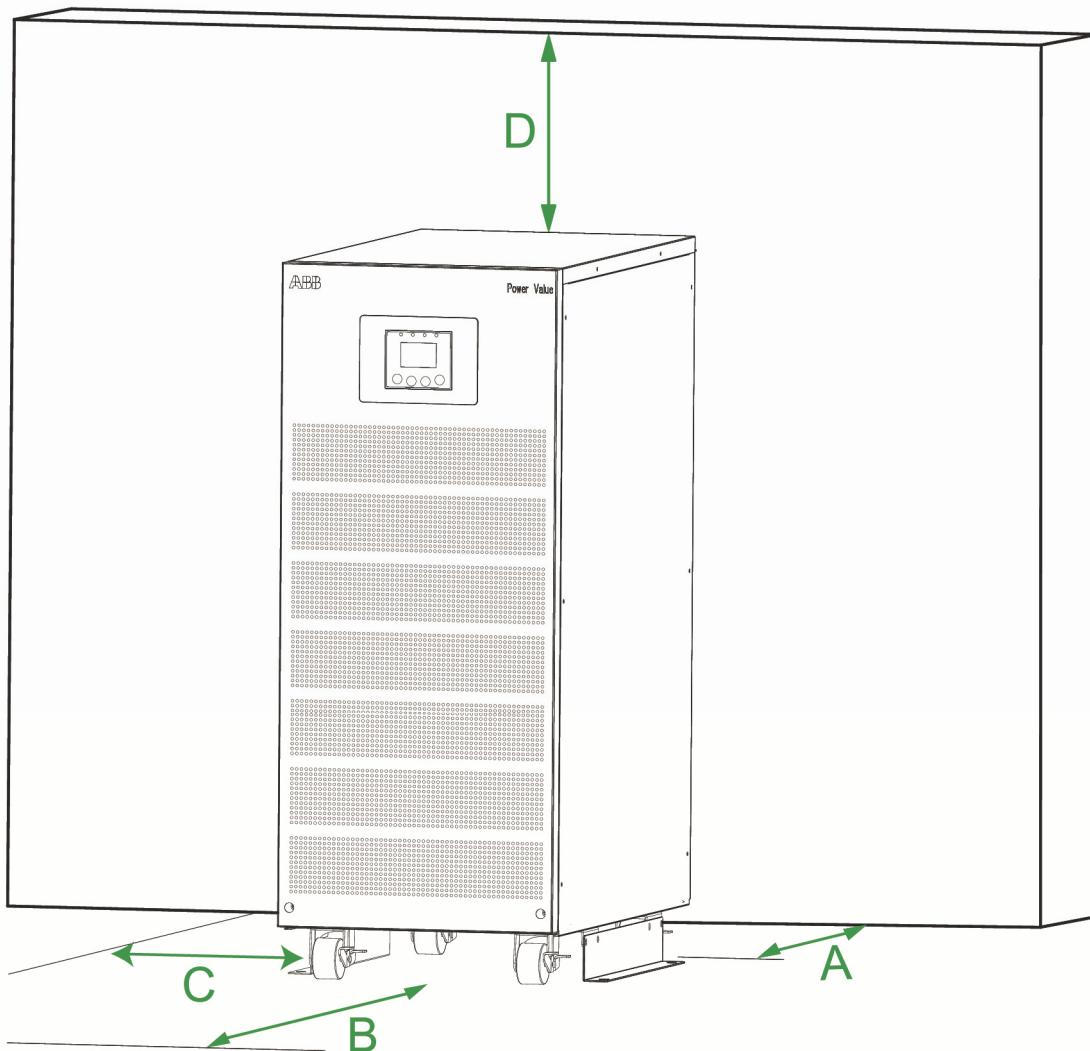
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SNMP card	For monitoring and integration in network management
Relay card	For additional signal-monitoring and control

DISPLAY & MIMIC DIAGRAM

10 kVA
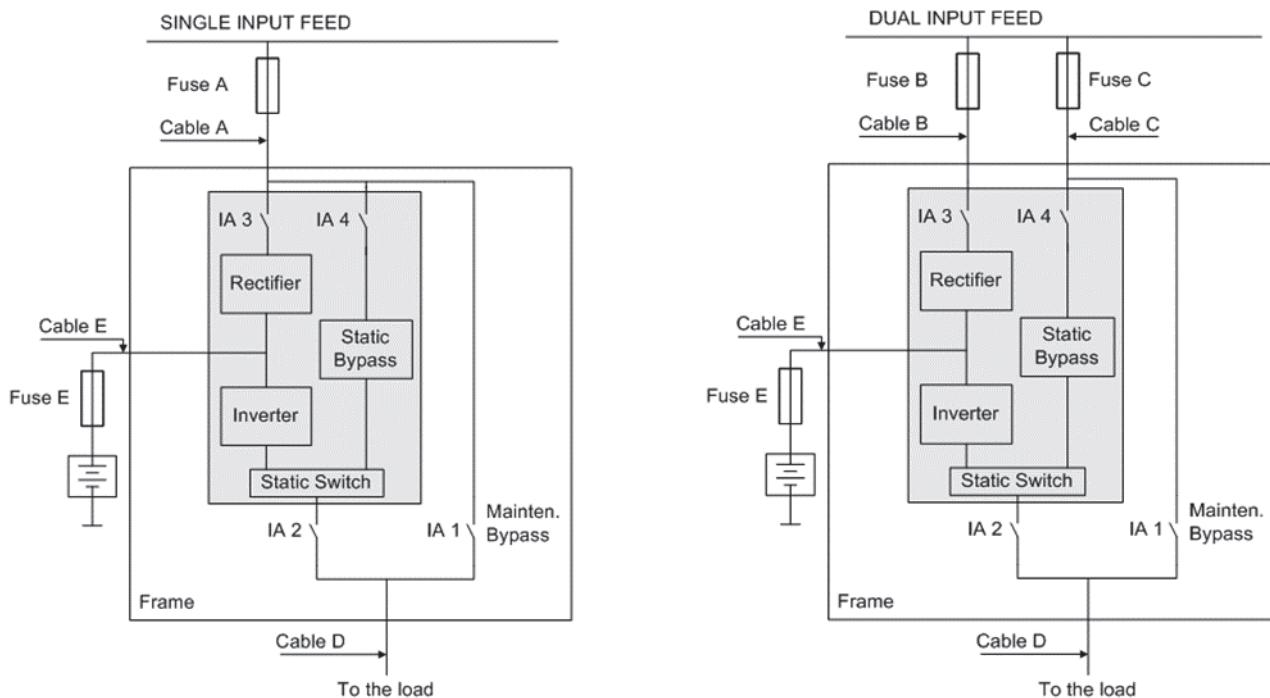
CLEARANCES	10 kVA	20 kVA
MINIMUM CLEARANCES FOR SINGLE UPS		
A	50 cm	50 cm
B	50 cm	50 cm
C	0 cm	0 cm
D	5 cm	5 cm
MINIMUM CLEARANCES FOR UPS PLUS OTHER CABINETS IN ROW		
A	50 cm	50 cm
B	50 cm	50 cm
C	0 cm	0 cm
D	5 cm	5 cm

HEAT DISSIPATION	10 kVA	20 kVA
Air-flow	From front to back	
Heat dissipation with 100% linear load	669 W / 2282.7 BTU	1207 W / 4118.5 BTU
Heat dissipation with 100% non-lin. load (acc. to 62040-3)	669 W / 2282.7 BTU	1207 W / 4118.5 BTU
Air-flow (25° - 30°) with 100% non-linear load	133 m³/h	240 m³/h
Heat Dissipation without load	160 W	170 W

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CABLES & FUSES

Cable sections and fuse ratings recommended according to (IEC 60950-1)
Alternatively, local standards to be respected!

RATINGS	10 kVA (1-1)	10 kVA (3-1)	20 kVA (1-1)	20 kVA (3-1)
SINGLE INPUT FEED				
Input fuse A-Type: gL or CB	1 x 63A	3 x 63A	1 x 100A	3 x 100A
Input cable A	3 x 16mm^2	5 x 16mm^2	3 x 25mm^2	5 x 25mm^2
Output cable D	3 x 16mm^2	3 x 16mm^2	3 x 25mm^2	3 x 25mm^2
Battery fuse E-Type: gR or CB	2 x 40A	2 x 40A	2 x 80A	2 x 80A
Battery cable E	3 x 6mm^2	3 x 6mm^2	3 x 16mm^2	3 x 16mm^2
DUAL INPUT FEED				
Input fuse B-Type: gL or CB	1 x 63A	3 x 25A	1 x 100A	3 x 50A
Input Cable B	3 x 16mm^2	5 x 4mm^2	3 x 25mm^2	5 x 10mm^2
Input fuse C-Type: gR or CB	1 x 63A	1 x 63A	1 x 100A	1 x 100A
Input cable C	3 x 16mm^2	3 x 16mm^2	3 x 25mm^2	3 x 25mm^2
Output cable D	3 x 16mm^2	3 x 16mm^2	3 x 25mm^2	3 x 25mm^2
Battery fuse E-Type: gR or CB	2 x 40A	2 x 40A	2 x 80A	2 x 80A
Battery cable E	3 x 6mm^2	3 x 6mm^2	3 x 16mm^2	3 x 16mm^2

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Contact us

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

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