TECHNICAL DATASHEET

UPS PowerValue 11/31/33T G2

10–20kVA

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

Working mode
Online double conversion

Module power rating
10–20kVA

Paralleling
up to 3 units

Output power factor
1.0

Higher efficiency
Up to 96% at normal mode

Maximum weight w/t battery
160 kg

Input THDI
<4%

Input power factor (PF)
≥0.99

Communication cards
Network Management Card – NMC
Modbus
AS400

UPS internal battery blocks
should be 5 mm apart

About this manual

Document information

File name	: 4NWD005717_TDS_ABB_PowerValue 11/31/33T G2 10-20kVA_EN_REV-A
UPS model	: PowerValue 11/31/33T G2 10~20kVA
Date of issue	: 14.08.2024
Issued by	: Sales
Checked by	: Product Marketing, R&D
Article number	: N/A
Document number	: 4NWD005717
Revision	: A

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UPS features

The PowerValue 11/31/33T G2 10-20kVA UPS uses an advanced double-conversion pure online architecture that continuously adjusts and filters the input voltage. When the mains power is interrupted, the battery will continue to provide power without interruption. In the event of an overload or inverter failure, the UPS will switch to bypass mode and be powered by the bypass. If the overload condition is eliminated, the UPS will automatically switch to the inverter power supply mode, providing high-quality and reliable AC power for important equipment.

Constant Voltage and Constant Frequency
CVCF is a specific output mode of UPS. Operating as a voltage and frequency converter, the PowerValue 11/31/33T G2 10–20kVA UPS 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 the event of mains failure. Operation and installation are simple, requiring the correct wiring of the UPS and selection of the CVCF mode in the LCD display.
• Input frequency range: 40–70Hz
• Output frequency: 50 or 60Hz
• Output derating:
- 10–20kVA: Derating 60% in 1:1 mode, No derating in 3:1 mode or 3:3 mode

Cold start
The PowerValue 11/31/33T G2 10–20kVA UPS can be started without being connected to the mains power supply (start up from batteries. Before using this feature, the UPS must have been powered by utility power with output enabled at least once). This feature is especially useful in the following situations:
• To start up and operate the unit, even throughout a power outage.
• During an unsuccessful system startup, to help identify if the malfunction is in the power supply, e.g., if the UPS starts up from the battery and does not transfer to the online or bypass mode, it is most likely that there has been a mains failure.

Remote Power Off (RPO)
When RPO is activated, the load's AC and DC sources are entirely disconnected. Operation: To recover the UPS's normal status, the RPO connector must be set back to its original configuration (normally closed through a jumper in the UPS rear panel). Following this, the RPO status must be cleared through the LCD menu and the UPS will recover its operation in standby mode. To transfer the UPS to inverter mode, please press the power button.

Fan speed control
The speed of the PowerValue 11/31/33T G2 10–20kVA UPS fans varies with the load level and with the ambient temperature to minimize the power consumption, while keeping the UPS at a safe working temperature.

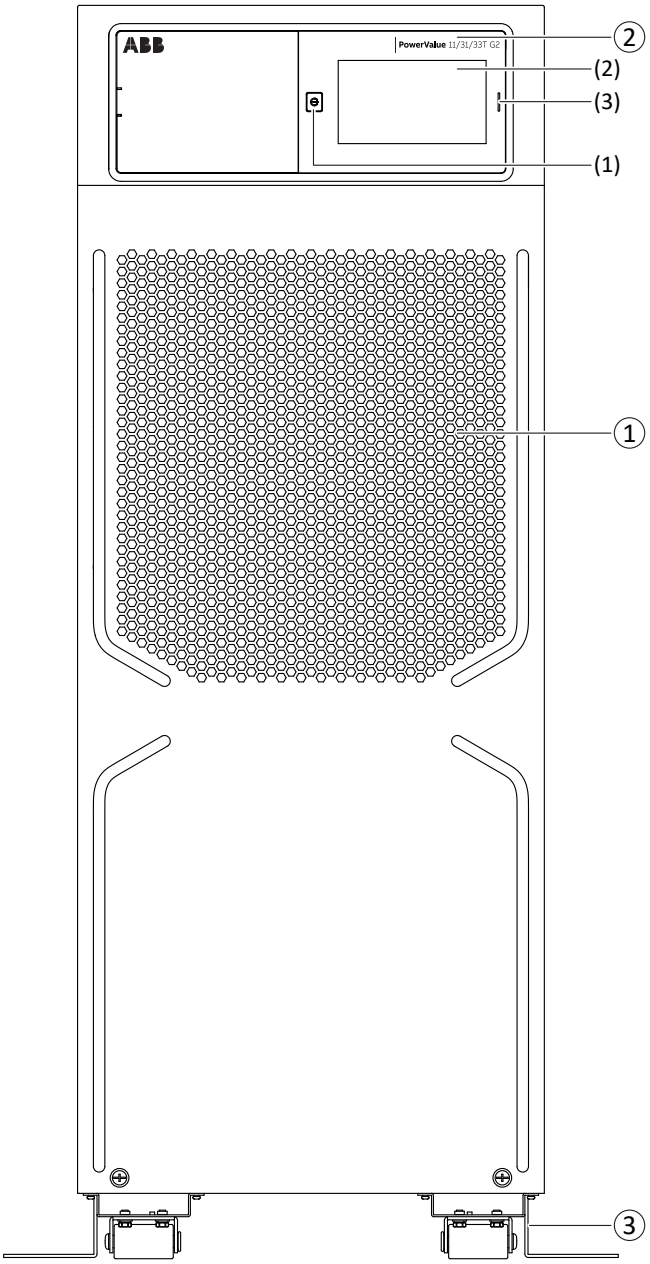
Wide input voltage and frequency range
With higher input tolerances, the UPS works longer in bypass or normal mode. This helps to reduce the consumption of the batteries when there are small variations in the power supply.

Paralleling
PowerValue 11/31/33T G2 10–20kVA UPS can be installed in parallel to increase the total system power or to add redundancy to the system. Up to 3 units can be paralleled. The UPSs are delivered with an inbuilt parallel board and paralleling cables. No additional hardware is required for this installation.

Design flexibility
PowerValue 11/31/33T G2 10–20kVA UPS is a modular design. It is easy to replace or maintain.

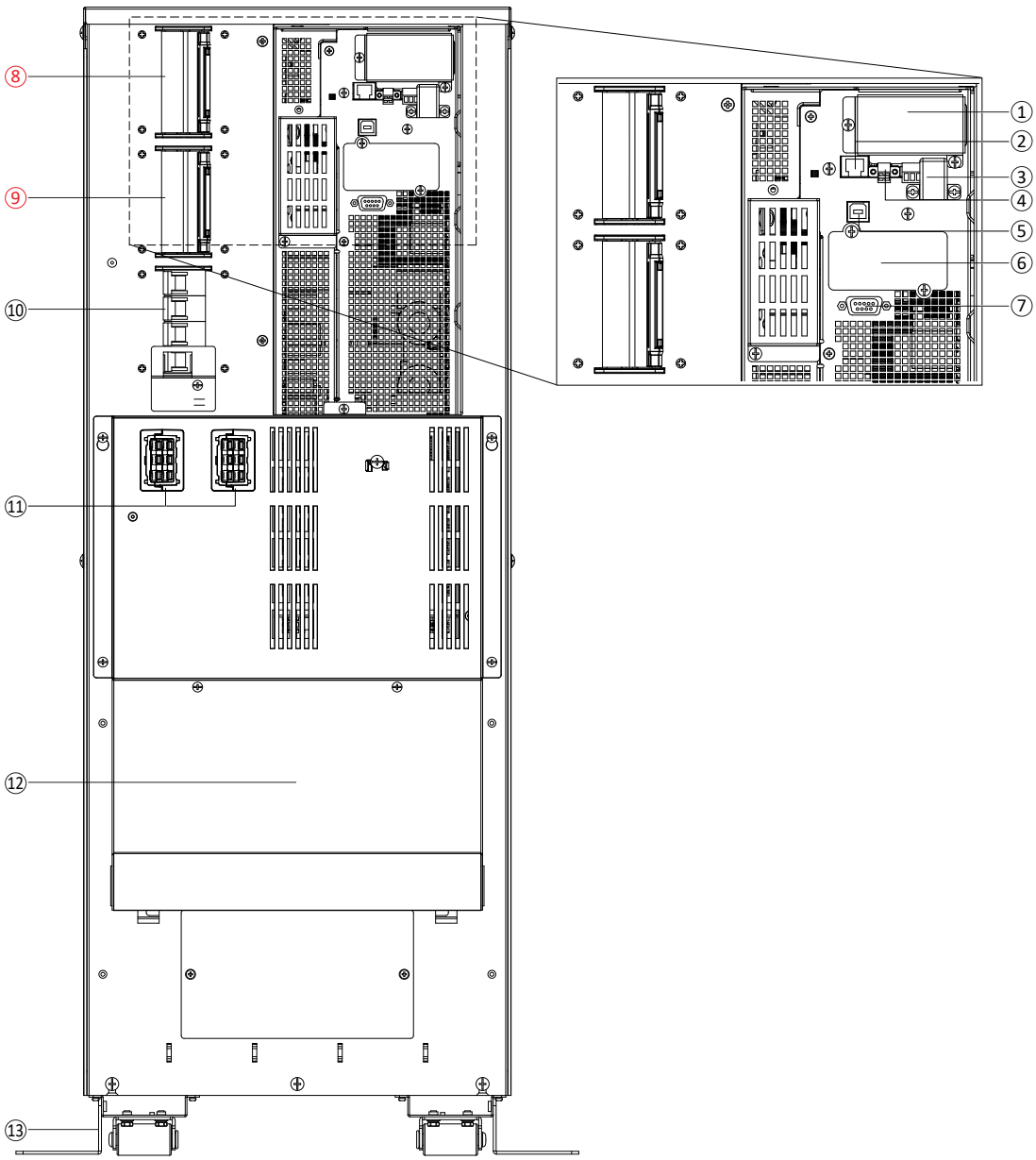
Superior performance
• Flexible charging current design. Charging current can be adjustable by LCD. Maximum charging current is 13A.
• High efficiency up to 96% for 20K and up to 95% for 10K
• Dry-out contact support 230V/1A and 48Vdc/1A
• With backfeed protection function for BF model

UPS cabinet Front/Rear view



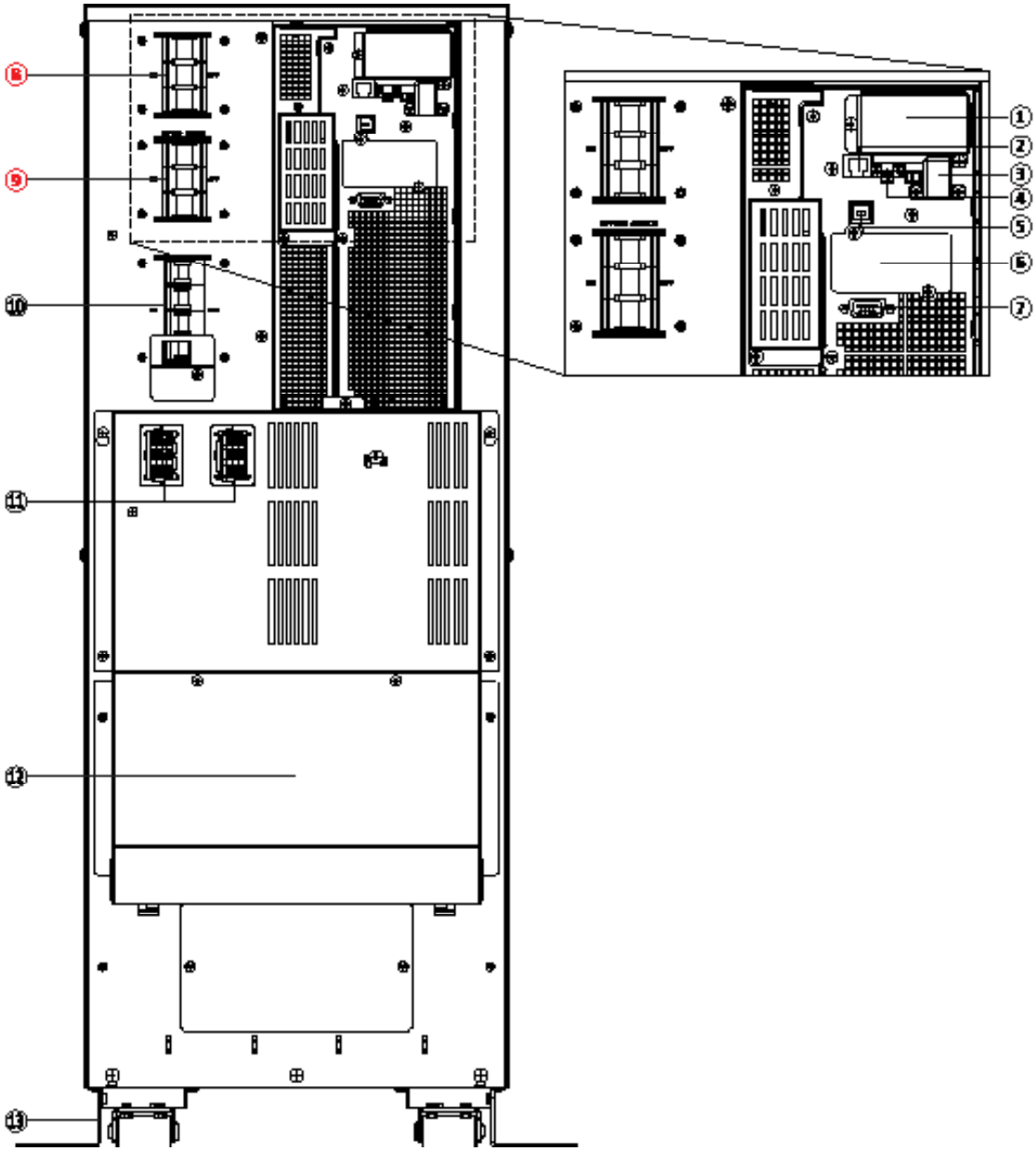
Front Panel view

No	Item
1	Ventilation area
2	LCD Modular, including
(1)	Power button
(2)	Touch screen
(3)	LED indicator
3	Tower foot



Front Panel view with BFP model

No	Item
1	Parallel port
2	RJ45 (for EBM detect)
3	DRY in/out (With anti-electric shock cover)
4	RPO
5	USB
6	Intelligent slot
7	RS232
8	Main input breaker
9	Bypass input breaker
10	Maintenance bypass switch
11	External battery port
12	AC Input/Output port (terminal block)
13	Tower foot



Front Panel view without BFP model

No	Item
1	Parallel port
2	RJ45 (for EBM detect)
3	DRY in/out (with anti-electric shock cover)
4	RPO
5	USB
6	Intelligent slot
7	RS232
8	Main input switch
9	Bypass input switch
10	Maintenance bypass switch
11	External battery port
12	AC Input/Output port (terminal block)
13	Tower foot

Options

Network interface card
Enables real-time monitoring of your UPS system via a standard web browser or by using the included monitoring software. ABB's monitoring devices provide real-time visibility of the condition of your power equipment and help solve problems before they become critical.

Supported models
- Network Management Card (NMC)

- Modbus Card (Modbus)

- Temperature and humidity sensors(EMP)

Relay interface card
Provides contact closures for remote monitoring of alarm conditions of PowerValue 11/31/33T G2 10–20kVA UPS systems. The card is user-installable, hot-swappable and enables advanced communication between the UPS and the computer.

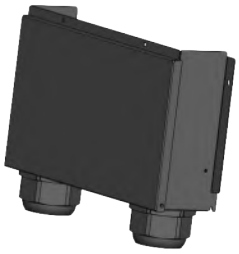
Models
- Relay card with potential-free contacts (AS400)

NMC Card	4NWP100110R0001
Modbus Card	4NWP104039R0001
EMP	4NWP104040R0001
AS400 Card	4NWP100120R0001

Monitoring software
It is an advanced UPS management software suite to allow remote control and monitoring of UPS equipped with network interface cards in a LAN or Internet environment. It can manage a single or multiple UPSs and prevent data loss from power outage by programming a safe system shutdown. The software is included with the NMC adapter.

Serial Communication Cable
- RS232 cable

UPS hard-wiring installation
- Gland Kit



Technical specifications

GENERAL DATA	10kVA B/10kVA B BF	100 kVA S/10kVA S BF	20 kVA B/20kVA B BF	20 kVA S/20 kVA S BF
Apparent power	10kVA	10kVA	20kVA	20kVA
Active power	10kW	10kW	20kW	20kW
UPS type	Online double conversion			
Battery	Inbuilt	/	Inbuilt	/
OVERVOLTAGE CATEGORY	Overvoltage category II			
MECHANICAL				
Dimensions (width×height×depth) [mm]	300*805*726	300*805*726	300*805*726	300*805*726
Weight (with batteries)	106 kg	53 kg	160 kg	55 kg
ACOUSTIC NOISE (ISO 7779&At front 1m distance, without buzzer)				
In normal mode (at <=25 °C) at 100/50% Load	<55 dBA	<55 dBA	<55 dBA	<55 dBA
In battery mode (at <=25 °C) at 100/50% Load	<58 dBA	<58 dBA	<58 dBA	<58 dBA
SAFETY				
Access	Operator	Operator	Operator	Operator
Degree of protection against hazards and water ingress	IP 20	IP 20	IP 20	IP 20
ELECTROMAGNETIC COMPATIBILITY				
Compliant to IEC 62040-2	Yes	Yes	Yes	Yes
Category Emission/Immunity	C3	C3	C3	C3
ENVIRONMENTAL				
Storage temperature range	-15 °C – +40 ° C	-25 °C – +55 °C	-15 °C – +40 °C	-25 °C – +55 °C
Operative temperature range	0 °C– +40 °C +40 °C – +50 °C (output power and charger current derating 50%)	0 °C – +40 °C +40 °C – +50 °C (output power and charger current derating 50%)	0 °C – +40 °C +40 °C – +50 °C (output power and charger current derating 50%)	0 °C – +40 °C +40 °C – +50 °C (output power and charger current derating 50%)
Relative humidity	≤95% (non-condensing)			
Operating altitude	0~4,000 m (1,000 m without derating; load derating 1% every 100 m @ 1,000~4,000 m)			
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)		5 wires (3 phase + N + PE) or 3 wires (1 phase + N + PE)	
Cable entry	Rear	Rear	Rear	Rear
External battery cable entry	Rear	Rear	Rear	Rear
Accessibility	Front and rear	Front and rear	Front and rear	Front and rear
UPS frame cabinet color	RAL9005			
Air outlet	Front to back	Front to back	Front to back	Front to back
OPTIONS				
Network Management Card (NMC) Temperature and humidity sensors (cooperate with NMC) Modbus card Relay card with potential-free contacts (customer outputs) RS232 cable Gland Kit				
INCLUDED (DEFAULT)				
pre-installed, parallel kit	Included	Included	Included	Included
Sea freight packaging (pallet, carton box)	Included	Included	Included	Included
maintenance bypass switch	Included	Included	Included	Included
Back-feed protection	Internal (BF model)	Internal (BF model)	Internal (BF model)	Internal (BF model)

INPUT CHARACTERISTICS	10 kVA B/10kVA B BF	10 kVA S/10kVA S BF	20kVA B/20kVA B BF	20kVA S/20kVA S BF
Acceptance voltage (steady-state, r.m.s)	100–300 VAC (L–N)			
Nominal voltage	220–240VAC (1Phase+N+PE)			
	380–415VAC (3Phase+N+PE)			
Tolerance	<100V:Go to battery mode 100V~160V:Max Load%=(input voltage–100V)*50%/(160V–100V)+50% 160V~300V:100 % load >300V:Go to battery mode			
Frequency, rated	50Hz/60Hz (selectable)			
Frequency tolerance	45 Hz – 55 Hz (50 Hz system) / 54 Hz – 66 Hz (60 Hz system)			
Rated Input Current	65A, 1Phase+N+PE 22A, 3Phase+N+PE	65A, 1Phase+N+PE 22A, 3Phase+N+PE	129A, 1Phase+N+PE 43A, 3Phase+N+PE	129A, 1Phase+N+PE 43A, 3Phase+N+PE
Maximum current (with charging batt. and input voltage tolerance)	67A, 1Phase+N+PE 24A, 3Phase+N+PE	67A, 1Phase+N+PE 24A, 3Phase+N+PE	131A, 1Phase+N+PE 45A, 3Phase+N+PE	131A, 1Phase+N+PE 45A, 3Phase+N+PE
Total harmonic distortion (THDi)	<4% @ 100% R Load	<4% @ 100% R Load	<4% @ 100% R Load	<4% @ 100% R Load
Power factor	≥ 0.99 @ 100% load	≥ 0.99 @ 100% load	≥ 0.99 @ 100% load	≥ 0.99 @ 100% load
Rated short-time withstand current (ICW) (Non-BF model)	2kA for 1 s	2kA for 1 s	2kA for 1 s	2kA for 1 s
AC power distribution system	TN-S, IT, TN-C, TT			
Phases required	3 phases or 1 phase	3 phases or 1 phase	3 phases or 1 phase	3 phases or 1 phase
Neutral required	Yes	Yes	Yes	Yes
Connection	5 wires (3 phase + N + PE) or 3 wires (1 phase + N + PE)			
Cable entry	Rear	Rear	Rear	Rear

OUTPUT CHARACTERISTICS	10kVA B/10kVA B BF	10kVA S/10kVA S BF	20 kVA B/20kVA B BF	20kVA S/20kVA S BF
Rated power	10,000W	10,000W	20,000W	20,000W
AC power distribution system	TN-S, IT, TN-C, TT			
Available phases	1	1	3 or 1	3 or 1
Neutral available	Yes	Yes	Yes	Yes
Three-phase balanced load	/	/	Yes	Yes
Rated voltage per phase (steady state, r.m.s.)	220–240 VAC (1Phase)	220–240 VAC (1Phase)	220–240 VAC (1Phase)	220–240 VAC (1Phase)
			380–415VAC (3Phase)	380–415VAC (3Phase)
Variation in normal mode / battery mode	± 1%	± 1%	± 1%	± 1%
Total Harmonic Distortion (THDu), 100% Load, Normal Mode				
- Linear	<1%	<1%	<1%	<1%
- Non-linear (acc. to IEC 62040-3)	<5%	<5%	<5%	<5%
Total Harmonic Distortion (THDu), 100% Load, Battery Mode				
- Linear	<1%	<1%	<1%	<1%
- Non-linear (acc. to IEC 62040-3)	<5%	<5%	<5%	<5%
Voltage Transient And Recovery Time, 100% Step Load				
- linear	200 ms	200 ms	200 ms	200 ms
- Non-linear (acc. to IEC 62040-3)	200 ms	200 ms	200 ms	200 ms
Transfer time normal mode --> battery mode	0 ms	0 ms	0 ms	0 ms
Frequency (steady-state), rated	Synchronized with the input mains: 45–55Hz for 50Hz systems 54–66Hz for 60Hz systems			
Variation in free-running	±0.1Hz	±0.1Hz	±0.1Hz	±0.1Hz
Max synch phase error (referred to a 360° cycle)	≤3°	≤3°	≤3°	≤3°
Max slew-rate	<1Hz/s	<1Hz/s	<1Hz/s	<1Hz/s
Nominal current (In), r.m.s. rated	45.5A	45.5A	90.9A @ 1phase	90.9A @ 1phase
			30.3A @ 3phase	30.3A @ 3phase
Overload on inverter	0.5s: load>150%; 1min: 125%<Load≤150% ; 10min: 105%<Load≤125% ; Continuously running: 100%<Load≤105% (Line Mode) 0.5s: load>150%; 30s: 125%<Load≤150% ; 11min: 105%<Load≤125% ; Continuously running: 100%<Load≤105% (Battery Mode)			
Fault clearing capability normal mode and battery mode (200ms)	90A for 1 phase	90A for 1 phase	222A for 1 phase	222A for 1 phase
			74A for 3 phase	74A for 3 phase
Crest factor (Load supported)	3 : 1	3 : 1	3 : 1	3 : 1
Load power factor, rated	1.0	1.0	1.0	1.0
Displacement (permissible lead-lag range)	0.3 lead – 0.3 lag (0.3~0.8:Derating 50%;0.8~1: No derating)	0.3 lead – 0.3 lag (0.3~0.8:Derating 50%;0.8~1: No derating)	0.3 lead – 0.3 lag (0.3~0.8:Derating 50%;0.8~1: No derating)	0.3 lead – 0.3 lag (0.3~0.8:Derating 50%;0.8~1: No derating)

DOUBLE CONVERSION EFFICIENCY IN NORMAL MODE, LINEAR LOAD:				
100% load	95%	95%	94%(1 phase)	94%(1 phase)
			95%(3 phase)	95%(3 phase)
75% load	95%	95%	95%(1 phase)	95%(1 phase)
			95%(3 phase)	95%(3 phase)
50% load	95%	95%	95%(1 phase)	95%(1 phase)
			96%(3 phase)	96%(3 phase)
25% load	93%	93%	95%(1 phase)	95%(1 phase)
			95%(3 phase)	95%(3 phase)
Eco-mode efficiency, linear load	98%	98%	98%	98%

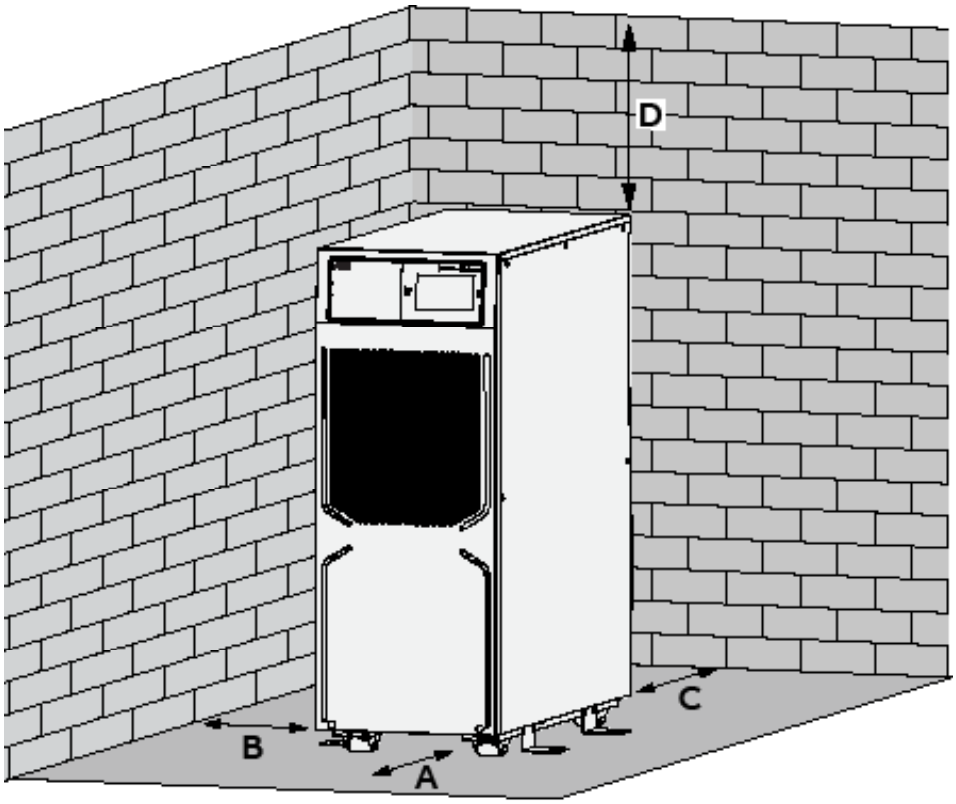
BYPASS—AUTOMATIC: STATIC SWITCH				
Transfer time: inverter to bypass / bypass to inverter / inverter to eco mode / eco mode 2 to inv.	0 ms / 0 ms / 0 ms / 2ms	0 ms / 0 ms / 0 ms / 2ms	0 ms / 0 ms / 0 ms / 2ms	0 ms / 0 ms / 0 ms / 2ms
Overload on bypass mode	continuous @ 105–125% load, 30s @ 125–150% load, 0.5s @ >150% load			

BATTERY CHARACTERISTICS	10kVA B/10kVA B BF	10kVA S/10kVA S BF	20kVA B/20kVA B BF	20kVA S/20kVA S B BF
Technology	VRLA, vented lead-acid	/	VRLA, vented lead-acid	/
Number of 12V blocks (fixed)	10 x 2 x 9Ah	/	20 x 2 x 9Ah	/
Battery charger rate current capability	Adjustable 1–13A Default 2A	Adjustable 1–13A Default 4A	Adjustable 1–13A Default 2A	Adjustable 1–13A Default 4A
Battery charger max. power charger capability	+/-1,817W	+/-1,817W	+/-3,634W	+/-3,634W
Floating voltage (VRLA)	2.31 VDC/cell	2.31 VDC/cell	2.31 VDC/cell	2.31 VDC/cell
End of discharge voltage (VRLA)	Load dependent, 1.6 VDC/cell@100% Load			
Temperature compensation	Yes	Yes	Yes	Yes
Battery test	Automatic and periodic battery test (selectable)	/	Automatic and periodic battery test (selectable)	/
Backup time (in minutes)	3/5/10/24	/	3/6/11/24	/
Backup time (in minutes)+1EBM	15/22/37/89	8/13/22/51	9/13/23/53	3/6/11/24
Backup time (in minutes)+2EBM	30/43/72/172	23/32/54/126	16/23/39/90	9/13/23/53
Backup time (in minutes)+3EBM	47/66/111/265	38/54/91/213	23/33/56/131	16/23/39/90
Backup time (in minutes)+4EBM	/	/	31/44/75/175	23/33/56/131
Backup time (in minutes)+5EBM	/	/	39/56/94/222	31/44/75/175
Backup time (in minutes)+6EBM	/	/	48/68/115/271	39/56/94/222

NOTE:
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.

USER INTERFACE—COMMUNICATION	
STANDARD ITEMS	
RS232 on Sub-D9 port	For service
Connectivity slot	For integration of optional connectivity and relay card
Display	LCD display
RPO	Remote Power Off
Dry IN/OUT contacts	Yes
USB (monitoring software)	Yes

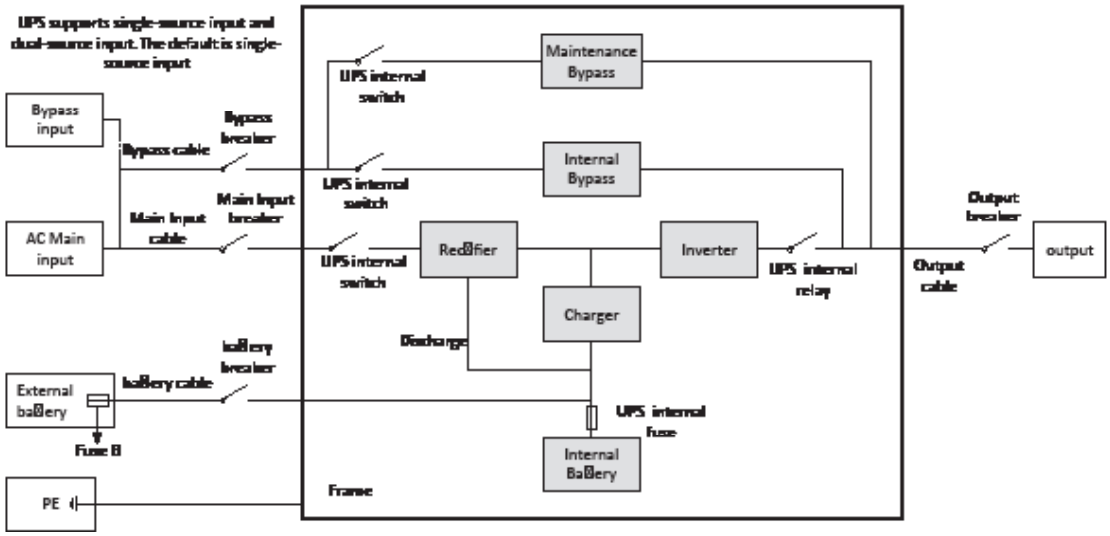
Clearances	10kVA B/10kVA B BF	10kVA S/10kVA S BF	20kVA B/20kVA B BF	20kVA S/20kVA S BF
Minimum clearances for single UPS				
A	500 mm	500 mm	500 mm	500 mm
B	0	0	0	0
C	500 mm	500 mm	500 mm	500 mm
D	50 mm	50 mm	50 mm	50 mm
Minimum clearances for UPS plus other cabinets in row				
A	500 mm	500 mm	500 mm	500 mm
B	0	0	0	0
C	500 mm	500 mm	500 mm	500 mm
D	50 mm	50 mm	50 mm	50 mm



HEAT DISSIPATION	10kVA B/10kVA B BF	10 kVA S/10kVA S BF	20kVA B/20kVA B BF	20kVA S/20kVA S BF
Airflow	From front to back	From front to back	From front to back	From front to back
Heat dissipation with 100% linear load	472W	472W	1,090W (1Phase)	1,090W (1Phase)
			854W (3 Phase)	854W (3 Phase)
Heat dissipation with 100% non-lin. load (acc. to 62040-3)	472W	472W	1,090W (1Phase)	1,090W (1Phase)
			854W (3 Phase)	854W (3 Phase)
Airflow (25°–30°) with 100% non-linear load	270 m^3/h	270 m^3/h	270 m^3/h	270 m^3/h
Heat dissipation without load	120W	120W	120W	120W

CABLE & BREAKER

Cable sections and breaker ratings recommended as follows :



RATINGS	10kVA B/10kVA B BF	10kVA S/10kVA S BF	20kVA B/20kVA B BF	20kVA s/20kVA S BF
SINGLE INPUT FEED				
Main Input breaker D-Type:	32A (3 phase)	32A (3 phase)	63A (3 phase)	63A (3 phase)
	80A (1 phase)	80A (1 phase)	160A (1 phase)	160A (1 phase)
Bypass Input breaker D-Type:	/	/	63A (3 phase)	63A (3 phase)
	63A (1 phase)	63A (1 phase)	125A (1 phase)	125A (1 phase)
Main Input cable (L1, L2, L3, N, PE)	4 x 4 mm^2 (3L, N), 10 mm^2 (PE) (3 phase)	4 x 4 mm^2 (3L, N), 10 mm^2 (PE) (3 phase)	5 x 10 mm^2 (3L, N, PE) (3 phase)	5 x 10 mm^2 (3L, N, PE) (3 phase)
	3 x 16 mm^2 (L, N, PE) (1 phase)	3 x 16 mm^2 (L, N, PE) (1 phase)	3 x 50 mm^2 (L, N, PE) (1 phase)	3 x 50 mm^2 (L, N, PE) (1 phase)
Bypass Input cable (L1, L2, L3, N, PE)	/	/	5 x 10 mm^2(3L, N, PE)	5 x 10 mm^2 (3L, N, PE)
	2 x 10 mm^2(L, N), 16 mm^2 (PE)	2 x 10 mm^2 (L, N), 16 mm^2 (PE)	2 x 25 mm^2 (1L, N) , 50 mm^2 (PE)	2 x 25 mm^2 (1L, N) , 50 mm^2 (PE)
Output breaker D-Type:	/	/	63A (3 phase)	63A (3 phase)
	63A (1 phase)	63A (1 phase)	125A (1 phase)	125A (1 phase)
Output cable (L1, L2, L3, N, PE)	/	/	5 x 10 mm^2 (3L, N, PE)	5 x 10 mm^2 (3L, N, PE)
	3 x 10 mm^2 (L, N, PE)	3 x 10 mm^2 (L, N, PE)	3 x 25 mm^2 (L, N, PE)	3 x 25 mm^2 (L, N, PE)
Battery breaker	80A	80A	80A	80A
External battery fuse B	2 x 100A	2 x 100A	2 x 100A	2 x 100A
External battery cable [+, N, -, PE]	4 x 10 mm^2	4 x 10 mm^2	4 x 10 mm^2	4 x 10 mm^2

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