

## TECHNICAL DATASHEET

# PowerValue 11 RT G2

## 1-10 kVA



PowerValue 11 RT G2  
1-3 kVA



PowerValue 11 RT G2  
6-10 kVA

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

**Working mode**  
on-line double conversion

**Module power rating**  
1-10 kVA

**Paralleling**  
up to 3 units (only 6-10 kVA)

**Output power factor**  
1.0

**Efficiency double conversion**  
up to 95%

**Efficiency in ECO-MODE**  
up to 98%

**Maximum weight w/out batteries**  
15.0 kg

**Input current distortion THDi**  
<3 %

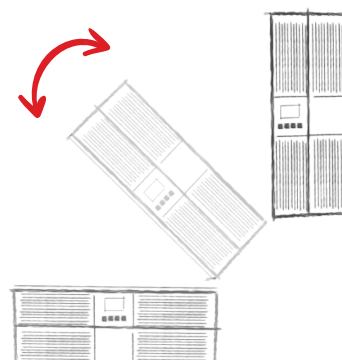
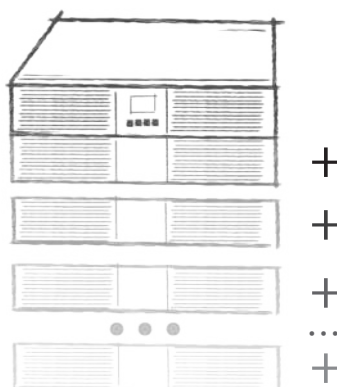
**Input power factor (PF)**  
≥ 0.995

**Communication cards**  
SNMP / Modbus / AS400

**Mechanical configuration**  
Rack-Tower with rotatable display



- Up to 9 battery modules per UPS can be added
- Rotatable display (90°)



# About this manual

## Document information

|                        |   |                                              |
|------------------------|---|----------------------------------------------|
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# UPS features



## Frequency conversion

Operating as a frequency converter, PowerValue 11 RT G2 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:
  - 1-3kVA: 45-66Hz
  - 6-10kVA: 40-70Hz
- Output frequency: 50 or 60 Hz
- Output de-rating:
  - 1-3kVA: 60%
  - 6-10kVA: 80%

## Cold start

PowerValue 11 RT G2 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 start up and operate the unit even throughout a power outage.
- 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.

## 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
- 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.

## Paralleling

PowerValue 11 RT G2 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.

**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 normal-mode, the selection has to be made through the LCD display.

**Fan speed control**

The speed of PowerValue 11 RT G2 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.

**Design flexibility**

PowerValue 11 RT G2 is extremely compact and is designed to be positioned in a tower format or rack-mounted. The display is rotatable (1-3kVA electronically, 6-10kVA mechanically) and therefore easy adjustable to your configuration needs.

**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 G2, the power of the generator should be dimensioned 1.3 times the UPS rated power.

**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 (only for 6-10kVA), the battery modules should be firstly connected to each UPS. Only after this procedure is done, the UPSs should be connected in parallel.

Long backup models are available in the range 1-3 kVA with max. 6A battery charger integrated in the UPS (no internal batteries). The battery charger current is self adjusted by the UPS in function of the external battery system capacity. The 6-10 kVA UPS provides an adjustable battery charger current (up to 12A) for ease of operations demanding long backup.



# 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).

## 1-3 KVA



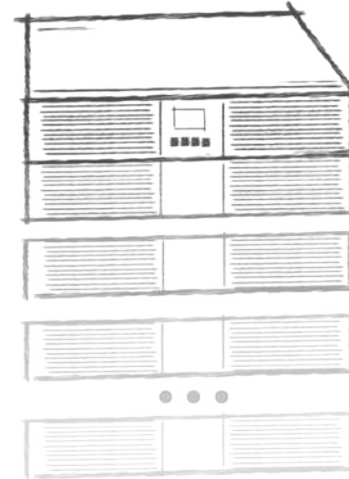
+



## 6-10 KVA



+



up to 9

## UPS BATTERY TYPE

|  | Power (kVA) | Internal batteries | Charging current    |
|--|-------------|--------------------|---------------------|
|  | 1 kVA B     | 1 x 2 x 9.4Ah      | 1.5A                |
|  | 1 kVA S     | –                  | max. 6A             |
|  | 2 kVA B     | 1 x 4 x 9.4Ah      | 1.5A                |
|  | 2 kVA S     | –                  | max. 6A             |
|  | 3 kVA B     | 1 x 6 x 9.4Ah      | 1.5A                |
|  | 3 kVA S     | –                  | max. 6A             |
|  | 6 kVA       | –                  | 0-12A (default: 4A) |
|  | 10 kVA      | –                  | 0-12A (default: 4A) |

## EXTERNAL BATTERY TYPE MODULE

|  | Power (kVA) | Dimensions (WxHxD) [mm] | Weight [kg] | Battery         |
|--|-------------|-------------------------|-------------|-----------------|
|  | 1 kVA B     | 438x86.2x309.8          | 17.92 kg    | (2 x 2) x 9.4Ah |
|  | 1 kVA S     | 438x86.2x309.8          | 17.92 kg    | (2 x 2) x 9.4Ah |
|  | 2 kVA B     | 438x86.2x426.5          | 31.32 kg    | (2 x 4) x 9.4Ah |
|  | 2 kVA S     | 438x86.2x426.5          | 31.32 kg    | (2 x 4) x 9.4Ah |
|  | 3 kVA B     | 438x86.2x629.8          | 44.90 kg    | (2 x 6) x 9.4Ah |
|  | 3 kVA S     | 438x86.2x629.8          | 44.90 kg    | (2 x 6) x 9.4Ah |
|  | 6 kVA       | 438x129x592             | 62.1 kg     | (1 x 20) x 9Ah  |
|  | 10 kVA      | 438x129x592             | 62.1 kg     | (1 x 20) x 9Ah  |

## BATTERY AUTONOMY

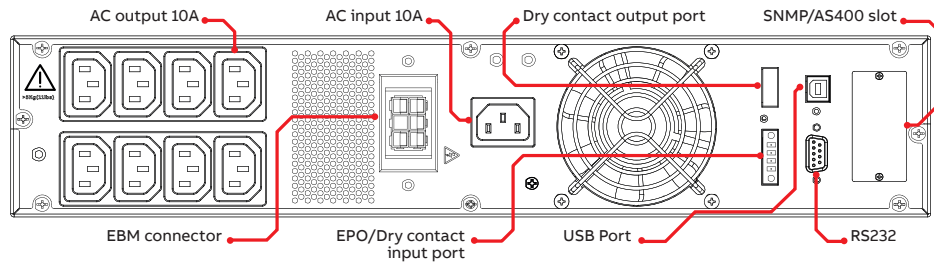
| Power (kVA) | UPS internal batteries | UPS + 1 batt module | UPS + 2 batt module | UPS + 3 batt module | UPS + 4 batt module  |
|-------------|------------------------|---------------------|---------------------|---------------------|----------------------|
| 1 kVA B     | 4 / 6 / 20 / 23        | 21 / 30 / 48 / 104  | 40 / 55 / 86 / 179  | 59 / 81 / 124 / 255 | 79 / 106 / 162 / 331 |
| 1 kVA S     | –                      | 12 / 18 / 29 / 66   | 30 / 42 / 67 / 141  | 49 / 73 / 105 / 217 | 69 / 94 / 143 / 293  |
| 2 kVA B     | 4 / 6 / 11 / 23        | 21 / 30 / 49 / 105  | 40 / 56 / 87 / 181  | 60 / 82 / 126 / 258 | 80 / 108 / 164 / 335 |
| 2 kVA S     | –                      | 12 / 18 / 30 / 68   | 31 / 44 / 69 / 145  | 50 / 70 / 108 / 222 | 70 / 96 / 147 / 300  |
| 3 kVA B     | 4 / 6 / 11 / 24        | 22 / 31 / 50 / 108  | 42 / 57 / 89 / 186  | 61 / 84 / 129 / 264 | 82 / 99 / 168 / 343  |
| 3 kVA S     | –                      | 13 / 19 / 32 / 72   | 32 / 45 / 72 / 152  | 51 / 72 / 112 / 233 | 72 / 98 / 152 / 315  |
| 6 kVA       | –                      | 7 / 10 / 18 / 49    | 18 / 28 / 49 / 133  | 33 / 49 / 88 / >180 | 49 / 75 / 133 / >180 |
| 10 kVA      | –                      | 3 / 5 / 9 / 24      | 9 / 13 / 24 / 64    | 16 / 24 / 43 / 115  | 24 / 36 / 64 / 173   |

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

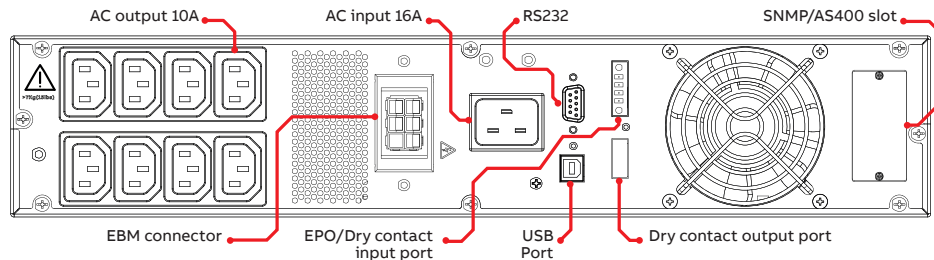
Given runtimes are estimates and valid at 20 degrees Celsius. Actual runtime of the system will depend, among many variables, on the age of the batteries and environmental conditions

# Rear view

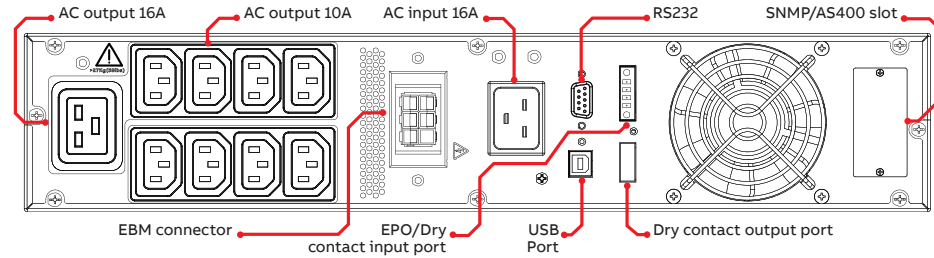
## 1 KVA B, 1 KVA S



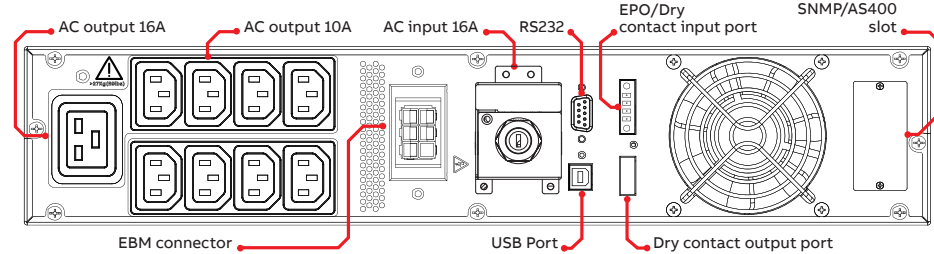
## 2 KVA B, 2 KVA S



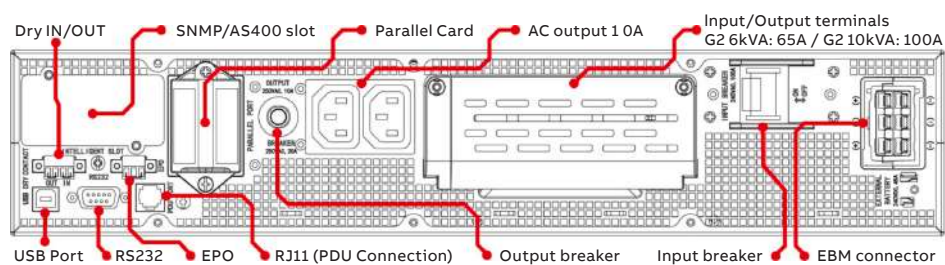
## 3 KVA B



## 3 KVA S



## 6-10 KVA



CONNECTORS / SOCKETS

| Product name       | Output socket |                 |         |                                                                                     | Input socket |                          |         |                                                                                       |
|--------------------|---------------|-----------------|---------|-------------------------------------------------------------------------------------|--------------|--------------------------|---------|---------------------------------------------------------------------------------------|
|                    | Qty           | Type            | Current | Drawing                                                                             | Qty          | Type                     | Current | Drawing                                                                               |
| 1 kVA B<br>1 kVA S | 8             | IEC-320C13      | 10 A    |    | 1            | IEC-320C14               | 10 A    |    |
| 2 kVA B<br>2 kVA S | 8             | IEC-320C13      | 10 A    |    | 1            | IEC-320C20               | 16 A    |    |
| 3 kVA B            | 8             | IEC-320C13      | 10 A    |    | 1            | IEC-320C20               | 16 A    |    |
|                    | 1             | IEC-320C19      | 16 A    |    |              |                          |         |                                                                                       |
| 3 kVA S            | 8             | IEC-320C13      | 10 A    |   | 1            | Terminals<br>Cable gland | 24 A    |  |
|                    | 1             | IEC-320C19      | 16 A    |  |              |                          |         |                                                                                       |
| 6 kVA              | 2             | IEC-320C13      | 10 A    |  | 1            | Terminal Blocks          | 65 A    |  |
|                    | 1             | Terminal Blocks | 65 A    |  |              |                          |         |                                                                                       |
| 10 kVA             | 2             | IEC-320C13      | 10 A    |  | 1            | Terminal Blocks          | 100 A   |  |
|                    | 1             | Terminal Blocks | 100 A   |  |              |                          |         |                                                                                       |

# Options

For 1-3 kVA, an external enclosure is necessary to connect via RS232 to the UPS.

## RACK MOUNTING KITS

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

## 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 in solving problems before they become critical.

## SUPPORTED MODELS

- WebPro SNMP (1-3kVA)
- WebPro ModBus (1-3kVA)
- Winpower SNMP (6-10kVA)
- Winpower Modbus (for 6-10kVA only RS485)
- Environmental Monitoring Probe

Third party adapters can be installed as well<sup>1</sup>:

- CS141 slot / box Basic
- CS141 slot / box Advanced
- CS141 slot / box ModBus



## 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 G2 systems.

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

## Models

- AS400

## EXTERNAL MAINTENANCE BYPASS WITH PDU

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. Two models are available, respectively for 1-3 kVA and 6-10 kVA.

## ATS 16A

The ATS-16 is a two-way, single-phase, automatic switch powered by two independent synchronous or asynchronous AC power supply sources (typically two feeding UPSs upstream).

One of the two sources can be designated as the preferred power supply, to which the ATS-16 will transfer the load. The ATS-16 promptly switches to the other source in the event of primary source failure. The external maintenance bypass with PDU delivers a maintenance bypass feature and convenient power distribution. This enables the user to service the UPS in a safe and proper manner by excluding any risk for the operator while the load is powered by the AC mains.

Easy to install in a rack-mount (1RU only) or vertical configuration, the ATS-16 has an intuitive interface with LED indicators and push buttons.

The ATS-16 enhances the system reliability due to internal back-feed protection and complete protection for overload and short-circuit.

## 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 SNMP adapter.

# Technical specifications

| GENERAL DATA                                                                              |  | 1 kVA (B/S)                                                                       | 2 kVA (B/S)                      | 3 kVA (B/S)                      | G2 6 kVA                                                                            | G2 10 kVA                    |
|-------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------|----------------------------------|----------------------------------|-------------------------------------------------------------------------------------|------------------------------|
| Photograph                                                                                |  |  |                                  |                                  |  |                              |
| Apparent power                                                                            |  | 1 kVA                                                                             | 2 kVA                            | 3 kVA                            | 6 kVA                                                                               | 10 kVA                       |
| Active power                                                                              |  | 1 kW                                                                              | 2 kW                             | 3 kW                             | 6 kW                                                                                | 10 kW                        |
| UPS type                                                                                  |  | On-line,<br>transformer-free                                                      | On-line,<br>transformer-free     | On-line,<br>transformer-free     | On-line,<br>transformer-free                                                        | On-line,<br>transformer-free |
| Parallel capability                                                                       |  | No                                                                                | No                               | No                               | Up to 3 frames                                                                      | Up to 3 frames               |
| Battery                                                                                   |  | Included (B)<br>Not included (S)                                                  | Included (B)<br>Not included (S) | Included (B)<br>Not included (S) | Not included                                                                        | Not included                 |
| Performance classification                                                                |  | VFI-SS-111                                                                        | VFI-SS-111                       | VFI-SS-111                       | VFI-SS-111                                                                          | VFI-SS-111                   |
| MECHANICAL                                                                                |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| Dimensions (width×height×depth) [mm]                                                      |  | 438 x 86.2 x 309.8                                                                | 438 x 86.2 x 426.5               | 438 x 86.2x 629.8                | 438 x 86.5 x 573                                                                    | 438 x 86.5 x 573             |
| Weight (with batteries)                                                                   |  | 11.4kg (B), 5.8kg (S)                                                             | 19.1kg (B), 8.7kg (S)            | 27.9kg (B), 9.0 kg (S)           | 13.1 kg                                                                             | 15.0 kg                      |
| ACOUSTIC NOISE (acc. To IEC 62040-3)                                                      |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| In normal mode (at <=25°C)<br>at 100 / 50 % Load                                          |  | <45 dBA                                                                           | <50 dBA                          | <50 dBA                          | <50 dBA                                                                             | <50 dBA                      |
| In battery mode (at <=25°C)<br>at 100 / 50 % Load                                         |  | <45 dBA                                                                           | <50 dBA                          | <50 dBA                          | <50 dBA                                                                             | <50 dBA                      |
| SAFETY                                                                                    |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| Access                                                                                    |  | Operator                                                                          | Operator                         | Operator                         | Operator                                                                            | Operator                     |
| Degree of protection against<br>hazards and water ingress                                 |  | IP 20                                                                             | IP 20                            | IP 20                            | IP 20                                                                               | IP 20                        |
| ELECTROMAGNETIC COMPATIBILITY                                                             |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| Compliant to IEC 62040-2                                                                  |  | Yes                                                                               | Yes                              | Yes                              | Yes                                                                                 | Yes                          |
| Category Emission / Immunity                                                              |  | C2                                                                                | C2                               | C2                               | C3                                                                                  | C3                           |
| ENVIRONMENTAL                                                                             |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| Storage temperature range                                                                 |  | -15°C – +60°C                                                                     | -15°C – +60°C                    | -15°C – +60°C                    | -15°C – +60°C                                                                       | -15°C – +60°C                |
| Operative temperature range                                                               |  | 0°C – +40°C                                                                       | 0°C – +40°C                      | 0°C – +40°C                      | 0°C – +40°C                                                                         | 0°C – +40°C                  |
| Storage (models with batteries)                                                           |  | 0°C – +35°C                                                                       | 0°C – +35°C                      | 0°C – +35°C                      | 0°C – +35°C                                                                         | 0°C – +35°C                  |
| Relative humidity                                                                         |  | ≤ 95% (non-condensing)                                                            |                                  |                                  | ≤ 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                                                         |                                  |                                  | 3 wires, 1 phase + N + PE                                                           |                              |
| Output connection                                                                         |  | 3 wires, 1 phase + N + PE                                                         |                                  |                                  | 3 wires, 1 phase + N + PE                                                           |                              |
| Cable entry                                                                               |  | Rear                                                                              | Rear                             | Rear                             | Rear                                                                                | Rear                         |
| Battery cable entry                                                                       |  | Rear                                                                              | Rear                             | Rear                             | Rear                                                                                | Rear                         |
| Accessibility                                                                             |  | Front only                                                                        | Front only                       | Front only                       | Front only                                                                          | Front only                   |
| Air outlet                                                                                |  | Rear                                                                              | Rear                             | Rear                             | Rear                                                                                | Rear                         |
| OPTIONS                                                                                   |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| Environmental monitoring probe                                                            |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| External battery modules (EBM)                                                            |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| Network interface cards/box                                                               |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| Relay card with potential-free contacts (customer outputs)                                |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| External maintenance bypass with PDU                                                      |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| ATS 16 A (for 1-3 kVA only)                                                               |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| Rack mounting kits for UPS and EBM                                                        |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| ModBus card                                                                               |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| INCLUDED (DEFAULT)                                                                        |  |                                                                                   |                                  |                                  |                                                                                     |                              |
| Parallel Kit (parallel board<br>pre-installed, parallel cable<br>provided with each unit) |  | N/A                                                                               | N/A                              | N/A                              | Included                                                                            | Included                     |
| Sea freight packaging (carton box)                                                        |  | Included                                                                          | Included                         | Included                         | Included                                                                            | Included                     |
| Back-feed protection                                                                      |  | Internal                                                                          | Internal                         | Internal                         | See manual                                                                          | See manual                   |

| INPUT CHARACTERISTICS                                            | 1 kVA (B/S)                                                                                                                  | 2 kVA (B/S)                                                                                                                  | 3 kVA (B/S)                                                                                                                  | G2 6 kVA                                                                                                                     | G2 10 kVA                                                                                                                    |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Rated voltage (steady-state, r.m.s)                              | 120-300VAC<br>(de-rating to<br>60% at 120V)                                                                                  | 120-300VAC<br>(de-rating to<br>60% at 120V)                                                                                  | 120-300VAC<br>(de-rating to<br>60% at 120V)                                                                                  | 100-276 VAC<br>(de-rating to<br>50% at 100V)                                                                                 | 100-276 VAC<br>(de-rating to<br>50% at 100V)                                                                                 |
| Nominal voltage                                                  | 208 VAC / 220 VAC /<br>230 VAC / 240 VAC                                                                                     | 208 VAC / 220 VAC /<br>230 VAC / 240 VAC                                                                                     | 208 VAC / 220 VAC /<br>230 VAC / 240 VAC                                                                                     | 208 VAC / 220 VAC /<br>230 VAC / 240 VAC                                                                                     | 208 VAC / 220 VAC /<br>230 VAC / 240 VAC                                                                                     |
| Tolerance, referred to 230V                                      | -22% / +30%<br>at <100% load,<br>-31% / +30%<br>at <80% load,<br>-41% / +30%<br>at <70% load,<br>-48% / +30%<br>at <60% load | -22% / +30%<br>at <100% load,<br>-31% / +30%<br>at <80% load,<br>-41% / +30%<br>at <70% load,<br>-48% / +30%<br>at <60% load | -22% / +30%<br>at <100% load,<br>-31% / +30%<br>at <80% load,<br>-41% / +30%<br>at <70% load,<br>-48% / +30%<br>at <60% load | -23% / +20%<br>at <100% load,<br>-33% / +20%<br>at <80% load,<br>-43% / +20%<br>at <60% load,<br>-48% / +20%<br>at <40% load | -23% / +20%<br>at <100% load,<br>-33% / +20%<br>at <80% load,<br>-43% / +20%<br>at <60% load,<br>-48% / +20%<br>at <40% load |
| Frequency, rated                                                 | 50 Hz / 60 Hz<br>(selectable)                                                                                                | 50 Hz / 60 Hz<br>(selectable)                                                                                                | 50 Hz / 60 Hz<br>(selectable)                                                                                                | 50 Hz / 60 Hz<br>(selectable)                                                                                                | 50 Hz / 60 Hz<br>(selectable)                                                                                                |
| Frequency tolerance                                              | 45 Hz – 55 Hz<br>(50 Hz system) /<br>54 Hz – 66 Hz<br>(60 Hz system)                                                         | 45 Hz – 55 Hz<br>(50 Hz system) /<br>54 Hz – 66 Hz<br>(60 Hz system)                                                         | 45 Hz – 55 Hz<br>(50 Hz system) /<br>54 Hz – 66 Hz<br>(60 Hz system)                                                         | 45 Hz – 55 Hz<br>(50 Hz system) /<br>54 Hz – 66 Hz<br>(60 Hz system)<br>Extendable to<br>40 Hz – 70 Hz<br>at load <60%       | 45 Hz – 55 Hz<br>(50 Hz system) /<br>54 Hz – 66 Hz<br>(60 Hz system)<br>Extendable to<br>40 Hz – 70 Hz<br>at load <60%       |
| Current (r.m.s), rated (with battery<br>charged and input 230V)  | 4.9 A                                                                                                                        | 9.6 A                                                                                                                        | 14.2 A                                                                                                                       | 27.5 A                                                                                                                       | 45.8 A                                                                                                                       |
| Current (r.m.s), maximum (with<br>charging batt. and input 230V) | 5.2 A (B)<br>5.9 A (S)                                                                                                       | 10.2 A (B)<br>11.4 A (S)                                                                                                     | 15.0 A (B)<br>16.9 A (S)                                                                                                     | 39.5 A                                                                                                                       | 57.8 A                                                                                                                       |
| Total harmonic distortion (THDi)                                 | < 5 % @ 100%<br>linear load                                                                                                  | < 5 % @ 100%<br>linear load                                                                                                  | < 5 % @ 100%<br>linear load                                                                                                  | <3% @ 100%<br>linear load                                                                                                    | <3% @ 100%<br>linear load                                                                                                    |
| Power factor                                                     | ≥ 0.99 @ 100% load                                                                                                           | ≥ 0.99 @ 100% load                                                                                                           | ≥ 0.99 @ 100% load                                                                                                           | ≥ 0.995 @ 100% load                                                                                                          | ≥ 0.995 @ 100% load                                                                                                          |
| Rated short-time<br>withstand current ( $I_{cw}$ )               | 3 kA for 1.5 cycles                                                                                                          | 3 kA for 1.5 cycles                                                                                                          | 3 kA for 1.5 cycles                                                                                                          | 6 kA for 1.5 cycles                                                                                                          | 6 kA for 1.5 cycles                                                                                                          |
| AC power distribution system                                     | TN-C, TN-C-S, TN-S, TT                                                                                                       |                                                                                                                              |                                                                                                                              | TN-S, IT                                                                                                                     |                                                                                                                              |
| Phases required                                                  | 1                                                                                                                            | 1                                                                                                                            | 1                                                                                                                            | 1                                                                                                                            | 1                                                                                                                            |
| Neutral required                                                 | Yes                                                                                                                          | Yes                                                                                                                          | Yes                                                                                                                          | Yes                                                                                                                          | Yes                                                                                                                          |
| Connection                                                       | 3 wires, 1 phase + N + PE                                                                                                    |                                                                                                                              |                                                                                                                              | 3 wires, 1 phase + N + PE                                                                                                    |                                                                                                                              |
| Cable entry                                                      | Rear                                                                                                                         | Rear                                                                                                                         | Rear                                                                                                                         | Rear                                                                                                                         | Rear                                                                                                                         |
| Walk In/Soft Start                                               | Yes<br>(Power supply needed only for first start-up)                                                                         |                                                                                                                              |                                                                                                                              | Yes<br>(Power supply needed only for first start-up)                                                                         |                                                                                                                              |

| OUTPUT CHARACTERISTICS                                                     | 1 kVA (B/S)                                                                                                                             | 2 kVA (B/S)                                     | 3 kVA (B/S)                                     | G2 6 kVA                                                          | G2 10 kVA                                       |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|
| Rated power                                                                | 1 kW                                                                                                                                    | 2 kW                                            | 3 kW                                            | 6 kW                                                              | 10 kW                                           |
| AC power distribution system                                               | TN-C, TN-C-S, TN-S, TT                                                                                                                  |                                                 |                                                 | TN-S, IT                                                          |                                                 |
| Available phases                                                           | 1                                                                                                                                       | 1                                               | 1                                               | 1                                                                 | 1                                               |
| Neutral available                                                          | Yes                                                                                                                                     | Yes                                             | Yes                                             | Yes                                                               | Yes                                             |
| Rated voltage<br>(steady state, r.m.s.)                                    | 208 / 220 /<br>230 / 240 V AC<br>(no de-rating)                                                                                         | 208 / 220 /<br>230 / 240 V AC<br>(no de-rating) | 208 / 220 /<br>230 / 240 V AC<br>(no de-rating) | 208 / 220 /<br>230 / 240 V AC<br>(no de-rating)                   | 208 / 220 /<br>230 / 240 V AC<br>(no de-rating) |
| Variation in normal mode /<br>battery mode                                 | ± 1%                                                                                                                                    | ± 1%                                            | ± 1%                                            | ± 1%                                                              | ± 1%                                            |
| Total Harmonic Distortion (THDu), 100% Load, Normal Mode                   |                                                                                                                                         |                                                 |                                                 |                                                                   |                                                 |
| - Linear                                                                   | < 2%                                                                                                                                    | < 2%                                            | < 2%                                            | < 1%                                                              | < 1%                                            |
| - Non-linear (acc. to IEC 62040-3)                                         | < 5%                                                                                                                                    | < 5%                                            | < 5%                                            | < 5%                                                              | < 5%                                            |
| Total Harmonic Distortion (THDu), 100% Load, Battery Mode                  |                                                                                                                                         |                                                 |                                                 |                                                                   |                                                 |
| - Linear                                                                   | < 2%                                                                                                                                    | < 2%                                            | < 2%                                            | < 1%                                                              | < 1%                                            |
| - Non-linear (acc. to IEC 62040-3)                                         | < 5%                                                                                                                                    | < 5%                                            | < 5%                                            | < 5%                                                              | < 5%                                            |
| Voltage Transient And Recovery Time, 100% Step Load                        |                                                                                                                                         |                                                 |                                                 |                                                                   |                                                 |
| - Linear                                                                   | 20 ms                                                                                                                                   | 20 ms                                           | 20 ms                                           | 20 ms                                                             | 20 ms                                           |
| - Non-linear (acc. to IEC 62040-3)                                         | 100 ms                                                                                                                                  | 100 ms                                          | 100 ms                                          | 100 ms                                                            | 100 ms                                          |
| Transfer time<br>normal mode --> battery mode                              | 0 ms                                                                                                                                    | 0 ms                                            | 0 ms                                            | 0 ms                                                              | 0 ms                                            |
| Frequency (steady-state), rated                                            | Synchronized with the input mains:<br>45-55 Hz for 50 Hz systems<br>54-66 Hz for 60 Hz systems<br>Range adjustable in 50/60 Hz +/- 4 Hz |                                                 |                                                 |                                                                   |                                                 |
| Variation in free-running                                                  | ± 0.1 Hz                                                                                                                                | ± 0.1 Hz                                        | ± 0.1 Hz                                        | ± 0.1 Hz                                                          | ± 0.1 Hz                                        |
| Max synch phase error<br>(referred to a 360° cycle)                        | ≤3°                                                                                                                                     | ≤3°                                             | ≤3°                                             | ≤3°                                                               | ≤3°                                             |
| Max slew-rate                                                              | 1 Hz/s                                                                                                                                  | 1 Hz/s                                          | 1 Hz/s                                          | 1 Hz/s                                                            | 1 Hz/s                                          |
| Nominal current (In), r.m.s. rated                                         | 4.5 A                                                                                                                                   | 9 A                                             | 13 A                                            | 26.1 A                                                            | 43.5 A                                          |
| Overload on inverter (line mode)                                           | 300ms: > 150% load,<br>10s: 130-150% load,<br>60s: 105-129% load,<br>continuous:100-104% load.                                          |                                                 |                                                 | 500ms: > 150% load,<br>20s: 125-150% load,<br>10m: 100-124% load. |                                                 |
| Fault clearing capability normal mode<br>and battery mode (100ms) *default | 2.0 x In                                                                                                                                | 2.0 x In                                        | 2.0 x In                                        | 3 x In                                                            | 3 x In                                          |
| Crest factor (Load supported)                                              | 3 : 1                                                                                                                                   | 3 : 1                                           | 3 : 1                                           | 3 : 1                                                             | 3 : 1                                           |
| Load power factor, rated                                                   | 1.0                                                                                                                                     | 1.0                                             | 1.0                                             | 1.0                                                               | 1.0                                             |
| Displacement<br>(permissible lead-lag range)                               | 0.5 lead – 0.5 lag                                                                                                                      | 0.5 lead – 0.5 lag                              | 0.5 lead – 0.5 lag                              | 0.5 lead – 0.5 lag                                                | 0.5 lead – 0.5 lag                              |

#### DOUBLE CONVERSION EFFICIENCY IN NORMAL MODE, LINEAR LOAD

|                                  |        |       |       |       |       |
|----------------------------------|--------|-------|-------|-------|-------|
| 100% load                        | 89%    | 91%   | 92%   | 94.1% | 94.2% |
| 75% load                         | 87.7%  | 88.2% | 91.6% | 94.9% | 94.7% |
| 50% load                         | 84.6%  | 86.5% | 90.6% | 95.0% | 95.1% |
| 25% load                         | 76.2%  | 80.6% | 88.8% | 94.0% | 94.3% |
| Eco-mode efficiency, linear load | ≥97.5% | ≥98%  | ≥98%  | ≥98%  | ≥98%  |

#### BYPASS—AUTOMATIC: STATIC SWITCH

|                                                                                                        |                                                                          |                                  |                                  |                                                                      |                                   |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------------------------------------------|-----------------------------------|
| Transfer time: inverter to bypass /<br>bypass to inverter / inverter to<br>eco-mode / eco-mode to inv. | <8 ms / <8 ms /<br><8 ms / <8 ms                                         | <8 ms / <8 ms /<br><8 ms / <8 ms | <8 ms / <8 ms /<br><8 ms / <8 ms | <4 ms / <4 ms /<br><4 ms / <10 ms                                    | <4 ms / <4 ms /<br><4 ms / <10 ms |
| Fault clearing capability<br>(bypass mode) for 20 ms                                                   | 26.6 x In <sup>1</sup> (120A)                                            | 22.2 x In <sup>1</sup> (200A)    | 15.3 x In <sup>1</sup> (200A)    | 15.3 x In <sup>1</sup> (400A)                                        | 13.3 x In <sup>1</sup> (580A)     |
| Overload on bypass mode                                                                                | 300ms: >180% load,<br>60s: 130-180 % load,<br>continuous: 101-129% load. |                                  |                                  | 500ms: >150% load,<br>30s: 125-150% load,<br>continuous: <125% load. |                                   |
| Bypass - maintenance                                                                                   | Optional, external                                                       | Optional, external               | Optional, external               | Optional, external                                                   | Optional, external                |
| Bypass protection fuse<br>or circuit breaker rating                                                    | External fusing according to section Cables and Fuses                    |                                  |                                  |                                                                      |                                   |

\*In (4s) if default is disabled (6-10k only)

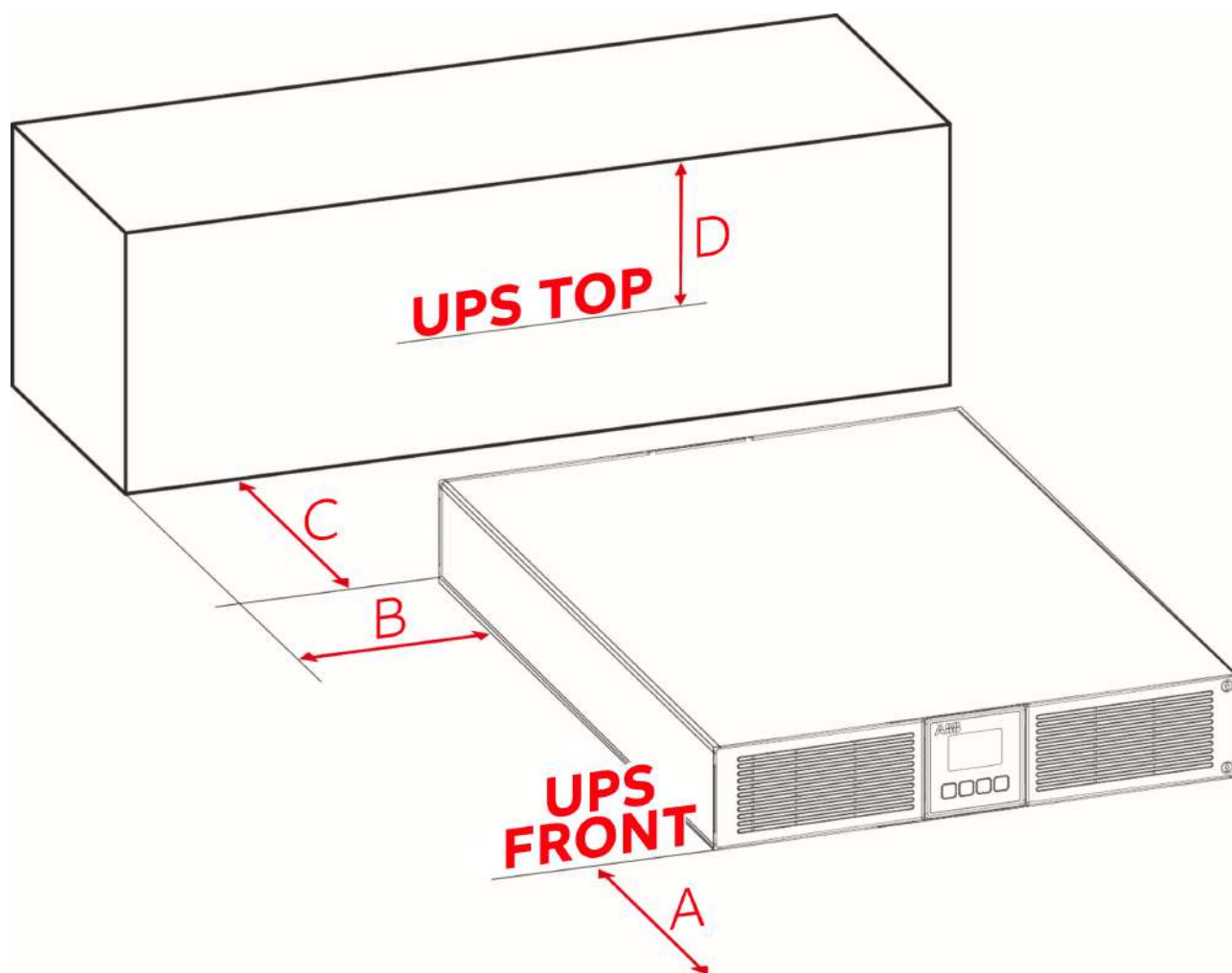
<sup>1</sup> With recommended fuses, see section Cables and Fuses

| BATTERY CHARACTERISTICS                 | 1 kVA (B/S)                                                                      | 2 kVA (B/S)                                                                      | 3 kVA (B/S)                                                                      | G2 6 kVA                                               | G2 10 kVA                                              |
|-----------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
| Technology                              | VRLA,<br>vented lead-acid                                                        | VRLA,<br>vented lead-acid                                                        | VRLA,<br>vented lead-acid                                                        | VRLA,<br>vented lead-acid                              | VRLA,<br>vented lead-acid                              |
| Number of 12 V blocks (fixed)           | 2 (B)<br>– (S)                                                                   | 4 (B)<br>– (S)                                                                   | 6 (B)<br>– (S)                                                                   | –                                                      | –                                                      |
| Battery charger max. current capability | 1.5 A (B)<br>6A (S)                                                              | 1.5 A (B)<br>6A (S)                                                              | 1.5 A (B)<br>6A (S)                                                              | 0-12A Adjustable<br>(4A default)                       | 0-12A Adjustable<br>(4A default)                       |
| Battery charger max. power capability   | 36 W (B)<br>144 W (S)                                                            | 72 W (B)<br>288 W (S)                                                            | 108 W (B)<br>432 W (S)                                                           | 3355 W                                                 | 3355 W                                                 |
| Floating voltage (VRLA)                 | 2.275 VDC/cell                                                                   | 2.275 VDC/cell                                                                   | 2.275 VDC/cell                                                                   | 2.275 VDC/cell                                         | 2.275 VDC/cell                                         |
| End of discharge voltage (VRLA)         | 10.7V/pcs,<br>0~30% Load<br>10.2V/pcs,<br>30%~70% Load<br>9.6V/pcs,<br>>70% Load | 10.7V/pcs,<br>0~30% Load<br>10.2V/pcs,<br>30%~70% Load<br>9.6V/pcs,<br>>70% Load | 10.7V/pcs,<br>0~30% Load<br>10.2V/pcs,<br>30%~70% Load<br>9.6V/pcs,<br>>70% Load | Load dependent<br>~1.6 VDC/cell                        | Load dependent<br>~1.6 VDC/cell                        |
| Temperature compensation                | Yes                                                                              | Yes                                                                              | Yes                                                                              | Yes                                                    | Yes                                                    |
| Battery test                            | Automatic and<br>periodic battery test<br>(selectable)                           | Automatic and<br>periodic battery test<br>(selectable)                           | Automatic and<br>periodic battery test<br>(selectable)                           | Automatic and<br>periodic battery test<br>(selectable) | Automatic and<br>periodic battery test<br>(selectable) |

#### USER INTERFACE – COMMUNICATION

|                                |                                                         |
|--------------------------------|---------------------------------------------------------|
| RS232 on Sub-D9 port           | For service and for CS141 box                           |
| Connectivity slot              | For integration of optional connectivity and relay card |
| Display                        | LCD display                                             |
| EPO                            | Emergency Power Off                                     |
| Dry IN/OUT contacts            | Yes                                                     |
| USB (monitoring software, HID) | Yes                                                     |

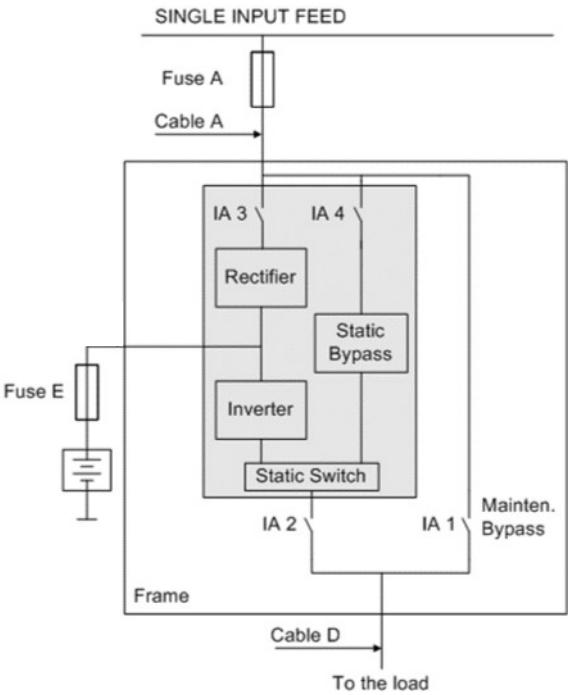
| CLEARANCES                                                   | 1 kVA (B/S) | 2 kVA (B/S) | 3 kVA (B/S) | G2 6 kVA | G2 10 kVA |
|--------------------------------------------------------------|-------------|-------------|-------------|----------|-----------|
| <b>MINIMUM CLEARANCES FOR SINGLE UPS</b>                     |             |             |             |          |           |
| 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      |
| <b>MINIMUM CLEARANCES FOR UPS PLUS OTHER CABINETS IN ROW</b> |             |             |             |          |           |
| 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 (B/S)        | 2 kVA (B/S)        | 3 kVA (B/S)        | G2 6 kVA           | G2 10 kVA          |
|------------------------------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Air-flow                                                   | From front to back | From front to back | From front to back | From front to back | From front to back |
| Heat dissipation with 100% linear load                     | 165 W              | 290 W              | 410 W              | 376 W              | 627 W              |
| Heat dissipation with 100% non-lin. load (acc. to 62040-3) | 165 W              | 290 W              | 410 W              | 376 W              | 627 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        | 125.000 m³/h       |
| Heat Dissipation without load                              | 43 W               | 50 W               | 57 W               | 70 W               | 100 W              |

CABLE & FUSE

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



| RATINGS                       | 1 kVA (B/S)              | 2 kVA (B/S)             | 3 kVA (B/S)                                                                                          | G2 6 kVA               | G2 10 kVA              |
|-------------------------------|--------------------------|-------------------------|------------------------------------------------------------------------------------------------------|------------------------|------------------------|
| Input fuse A-Type: gL or CB   | 1 x 10 A                 | 1 x 16 A                | 1 x 20 A                                                                                             | 1 x 63 A               | 1 x 80 A               |
| Input cable A                 | 3 x 0.75 mm <sup>2</sup> | 3 x 1.5 mm <sup>2</sup> | 3 x 1.5 mm <sup>2</sup> for 3kVA B<br>3 x 2.5 mm <sup>2</sup> for 3kVA S                             | 3 x 10 mm <sup>2</sup> | 3 x 16 mm <sup>2</sup> |
| Output cable D                | 3 x 0.75 mm <sup>2</sup> | 3 x 1.5 mm <sup>2</sup> | 3 x 1.5 mm <sup>2</sup> for 3kVA B<br>3 x 1.5 mm <sup>2</sup> and 3 x 2.5 mm <sup>2</sup> for 3kVA S | 3 x 10 mm <sup>2</sup> | 3 x 16 mm <sup>2</sup> |
| Battery fuse E-Type: gR or CB | 2 x 30 A                 | 2 x 30 A                | 2 x 30 A                                                                                             | 2 x 63 A               | 2 x 80 A               |

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