USER MANUAL

External maintenance bypass for PowerValue 11RT G2 5-10 kVA

	STATUS			
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Contents

1 Important safety instructions

1.1 Save these instructions

	THIS CHAPTER CONTAINS IMPORTANT SAFETY INSTRUCTIONS. READ IT CAREFULLY BEFORE DISASSEMBLING THE UNIT.
NOTE	THIS MANUAL CONTAINS IMPORTANT INSTRUCTIONS THAT SHOULD BE FOLLOWED DURING THE INSTALLATION AND MAINTENANCE OF THE PDU THE PDU MODELS THAT ARE COVERED IN THIS MANUAL ARE INTENDED FOR INSTALLATION IN ENVIRONMENTS WHERE TEMPERATURES ARE WITHIN 0 TO 40 °C AND ARE FREE OF CONDUCTIVE CONTAMINANTS.

1.2 Safety symbols and warnings

Follow all operating and user instructions.

	THIS SYMBOL IN CONJUNCTION WITH THE SIGNAL WORD **“DANGER”** INDICATES AN IMMINENT ELECTRICAL HAZARD. FAILURE TO OBSERVE THE RELATED SAFETY NOTE MAY CAUSE INJURY, DEATH OR EQUIPMENT DAMAGE.
	THIS SYMBOL IN CONJUNCTION WITH THE SIGNAL WORD **“WARNING”** INDICATES A POTENTIALLY DANGEROUS SITUATION. FAILURE TO OBSERVE MAY CAUSE INJURY, DEATH OR EQUIPMENT DAMAGE.
	THIS SYMBOL INDICATES A SAFETY NOTE: “ATTENTION! HAZARDOUS VOLTAGE!” INSTALLATION BY A CERTIFIED SERVICE ENGINEER ONLY.”
	THIS SYMBOL IN CONJUNCTION WITH THE SIGNAL WORD **“NOTE”** INDICATES OPERATOR TIPS OR PARTICULARLY USEFUL OR IMPORTANT INFORMATION FOR THE USE OF THE PRODUCT. THIS SYMBOL AND WORDING DO NOT INDICATE A DANGEROUS SITUATION.
	THIS SYMBOL INDICATES THAT READING THE INSTRUCTION MANUAL/ BOOKLET BEFORE STARTING WORK OR BEFORE OPERATING EQUIPMENT OR MACHINERY IS COMPULSORY.
	DO NOT DISPOSE OF WITH ORDINARY TRASH.

1.3 Safety rules

 **DANGER**	TERMINAL BLOCKS MAY BE ENERGIZED, EVEN IF THE SYSTEM IS DISCONNECTED FROM THE AC POWER SOURCE.
 **DANGER**	DANGEROUS VOLTAGE LEVELS ARE PRESENT WITHIN THE SYSTEM.
 **DANGER**	THE SYSTEM MUST BE PROPERLY GROUNDED: ALWAYS CONNECT THE EARTH WIRE FIRST.
 **WARNING**	CAUTION! TO REDUCE THE RISK OF FIRE, ONLY CONNECT THE UNIT TO A CIRCUIT PROVIDED WITH BRANCH CIRCUIT OVERCURRENT PROTECTION FOR: - 40A rating, for 5/6kVA models - 63A rating, for 8/10kVA models
 **WARNING**	CHECK THAT THE INDICATIONS ON THE RATING LABEL CORRESPOND WITH YOUR AC POWERED SYSTEM AND THE ACTUAL ELECTRICAL CONSUMPTION OF ALL THE EQUIPMENT TO BE CONNECTED TO THE SYSTEM.
 **WARNING**	NEVER INSTALL THE SYSTEM NEAR LIQUIDS OR IN AN EXCESSIVELY DAMP ENVIRONMENT.
 **WARNING**	NEVER BLOCK THE VENTILATION GRILLES GRATES OF THE SYSTEM.
 **WARNING**	NEVER EXPOSE THE SYSTEM TO DIRECT SUNLIGHT OR OTHER SOURCES OF HEAT.
 **NOTE**	THE UPSTREAM CIRCUIT BREAKER FOR NORMAL AC/BYPASS AC MUST BE EASILY ACCESSIBLE. THE UNIT CAN BE DISCONNECTED FROM THE AC POWER SOURCE BY OPENING THIS CIRCUIT BREAKER.
 **NOTE**	DISCONNECTION AND OVERCURRENT PROTECTION DEVICES ARE NOT INCLUDED AN MUST ALREADY BE INSTALLED FOR PERMANENTLY CONNECTED AC INPUT (NORMAL AC/BYPASS AC) AND AC OUTPUT CIRCUITS.
 **NOTE**	FOR PLUGGABLE EQUIPMENT, THE SOCKET OUTLET SHALL BE INSTALLED NEAR THE EQUIPMENT AND SHALL BE EASILY ACCESSIBLE.
 **NOTE**	IF THE SYSTEM NEEDS TO BE STORED PRIOR TO INSTALLATION, STORAGE MUST BE IN A DRY PLACE.
 **NOTE**	THE ADMISSIBLE STORAGE TEMPERATURE RANGE IS -15 TO +60 °C.

1.4 UPS disposal and recycling

1.4.1 For professional users in the European Union

THE CROSSED WHEELED BIN SYMBOL ON THE PRODUCT(S) AND / OR ACCOMPANYING DOCUMENTS MEANS THAT USED ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) SHOULD NOT BE MIXED WITH GENERAL HOUSEHOLD WASTE.

IF YOU WISH TO DISPOSE OF ELECTRICAL AND ELECTRONIC EQUIPMENT (EEE), PLEASE CONTACT YOUR DEALER OR SUPPLIER FOR FURTHER INFORMATION.

CORRECT WASTE DISPOSAL OF THIS PRODUCT WILL HELP SAVE VALUABLE RESOURCES AND PREVENT ANY POTENTIAL NEGATIVE EFFECTS ON HUMAN HEALTH AND THE ENVIRONMENT, WHICH COULD OTHERWISE ARISE FROM INAPPROPRIATE WASTE HANDLING

1.4.2 For disposal in countries outside of the European Union

THE CROSSED WHEELED BIN SYMBOL IS ONLY VALID IN THE EUROPEAN UNION (EU) MEANING THAT USED ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) SHOULD NOT BE MIXED WITH GENERAL HOUSEHOLDWASTE.

IF YOU WISH TO DISPOSE OF THIS PRODUCT PLEASE CONTACT YOUR LOCAL AUTHORITIES OR DEALER AND ASK FOR THE CORRECT METHOD OF DISPOSAL.
CORRECT WASTE DISPOSAL OF THIS PRODUCT WILL HELP SAVE VALUABLE RESOURCES AND PREVENT ANY POTENTIAL NEGATIVE EFFECTS ON HUMAN HEALTH AND THE ENVIRONMENT, WHICH COULD OTHERWISE ARISE FROM INAPPROPRIATE WASTE HANDLING

1.5 Certification standards

- Safety: UL 1778, CSA 107.3.
- IEC 61000-4-2 (ESD): level 3.
- Radiated: FCC CFR 47 Part 15 Class A.
- Conducted: FCC CFR 47 Part 15 Class A.
- IEC 61000-4-4 (EFT): level 3.
- IEC 61000-4-5 (Surge): level 2 (Line-Line), level 3(Line-Earth).
- IEC 61000-4-6 (CS): level 3.
- IEC 61000-4-8 (Power Frequency Magnetic Field Immunity): level 4.
- IEC 61000-2-2 (Low Frequency Signals)
- IEC 61000-4-3 (RS): level 3

2 Introduction

The module is used as an external maintenance bypass switch to provide continuous power without shutting down the connected loads during UPS scheduled maintenance or battery replacement. It's perfect to use in conjunction with ABB UPS PowerValue RT G2 5-10KVA UL

WE RECOMMEND YOU TAKE THE TIME TO READ THIS MANUAL TO TAKE FULL ADVANTAGE OF THE MANY FEATURES OF YOUR EMBS.

2.1 Environmental protection

Our products are developed using the eco-design approach.

2.1.1 Substances

This product does not contain CFCs, HCFCs, or asbestos.

2.1.2 Packing

To improve waste treatment and facilitate recycling, separate the various packing components.

- The cardboard we use comprises over 50% recycled cardboard.
- Sacks and bags are made of polyethylene.
- Packing materials are recyclable and bear the appropriate identification symbol

Materials	Abbreviations	Number in the symbols
Polyethylene terephthalate	PET	01
High-density polyethylene	HDPE	02
Polyvinyl chloride	PVC	03
Low-density polyethylene	LDPE	04
Polypropylene	PP	05
Polystyrene	PS	06

NOTE

FOLLOW ALL LOCAL REGULATIONS FOR THE DISPOSAL OF PACKING MATERIALS

3 General characteristics

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3-1
Front Panel view
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3-2
Rear panel view
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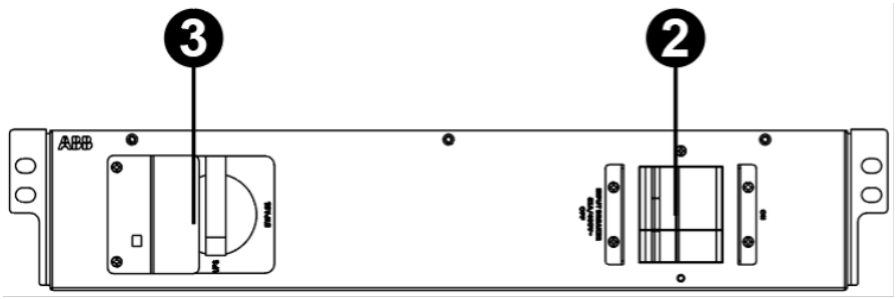
3-3
Terminal overview



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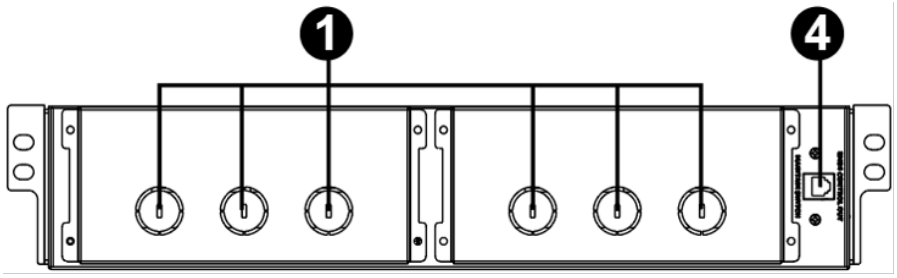
3-1



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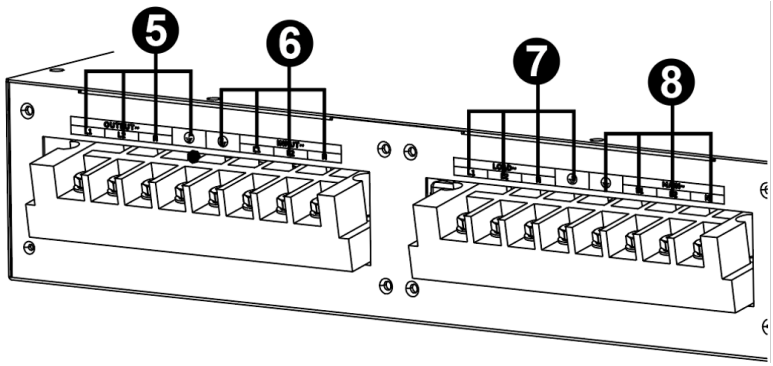
3-2



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3-3

No	Item
1.	Input/Output terminal (Refer to diagram 3 for the details)
2.	UPS input breaker
3.	Maintenance bypass switch
4.	Control output signal port
5.	UPS output terminal
6.	UPS input terminal
7.	Load terminal
8.	Mains terminal

4 Installation

	THE SYSTEM MUST BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE SAFETY REGULATIONS

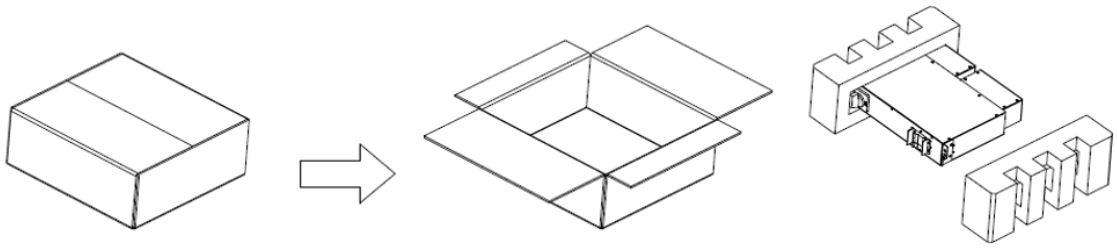
NOTE	INSTALLATION AND COMMISSIONING SHALL BE IN COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL SAFETY REGULATIONS AND MUST BE CARRIED OUT BY SUITABLY QUALIFIED PERSONS AS PER NATIONAL, STATE, AND LOCAL REQUIREMENTS.

4.1 Inspecting the equipment

WARNING	RISK OF FALLING: DISMANTLING THE UPS REQUIRES WORKING AT HEIGHT. TAKE THE NECESSARY PRECAUTIONS.

4.2 Unpacking the External Maintenance Bypass Switch Module

DANGER	UNPACKING THE UNIT IN A LOW-TEMPERATURE ENVIRONMENT MAY CAUSE CONDENSATION TO FORM BOTH INSIDE AND ON THE CABINET. DO NOT INSTALL THE UNIT UNTIL THE INSIDE AND OUTSIDE OF THE UNIT ARE DRY (RISK OF ELECTRIC SHOCK).



NOTE	IF ANY EQUIPMENT HAS BEEN DAMAGED DURING SHIPMENT, KEEP THE SHIPPING CARTONS AND PACKING MATERIALS FOR THE CARRIER OR PLACE OF PURCHASE AND FILE A CLAIM FOR SHIPPING DAMAGE. IF YOU DISCOVER THE DAMAGE AFTER ACCEPTANCE, FILE A CLAIM FOR CONCEALED DAMAGE

	DISCARD OR RECYCLE THE PACKAGING IN A RESPONSIBLE MANNER OR STORE IT FOR FUTURE USE. PACKING MATERIALS MUST BE DISPOSED OF IN COMPLIANCE WITH ALL LOCAL REGULATIONS CONCERNING WASTE. RECYCLING SYMBOLS ARE PRINTED ON THE PACKING MATERIALS TO FACILITATE SORTING.

4.3 Checking the accessory kit

Unpack the package and check the package contents. The shipping package contains:

- EMBS module x 1
- Quick guide x 1
- Control signal cable x 1
- M6 Screws x 4 & Nuts x 4
- Long extension x 1
- Connect plate x 1
- M3 screws x 2

NOTE

BEFORE INSTALLATION, PLEASE INSPECT THE UNIT. BE SURE THAT NOTHING INSIDE THE PACKAGE IS DAMAGED DURING TRANSPORTATION. DO NOT TURN ON THE UNIT AND NOTIFY THE CARRIER AND DEALER IMMEDIATELY IF THERE IS ANY DAMAGE OR LACKING OF SOME X.

PLEASE KEEP THE ORIGINAL PACKAGE IN A SAFE PLACE FOR FUTURE USE.

4.4 Installing the External Maintenance Bypass Switch Module

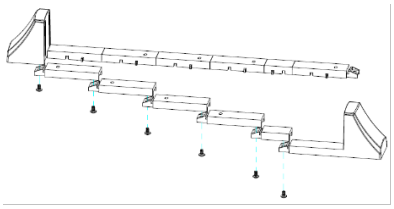
The module can be installed with UPS by rack or tower. Customer can choose suitable method.

4.4.1 Installing in the tower position:

4.4.1-1 Step 1
4.4.1-2 Step 2

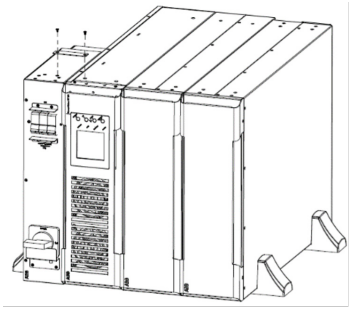
Please follow below diagram for tower installation.

Step 1: prepare the tower feet(UPS accessary) and extension feet, the extension feet depend on your system configuration. (tower feet=2U, long extension=2U, short extension=1U)



4.4.1-1

Step 2: fix the connect plate between EMBS and UPS, and place EMBS, UPS, EBM, ISO TX (optional) on tower feet assembly;



4.4.1-2

4.4.2 Installing in the rack position:

The module can be mounted to a 19” enclosure. Please follow below diagram for rack mount installation.

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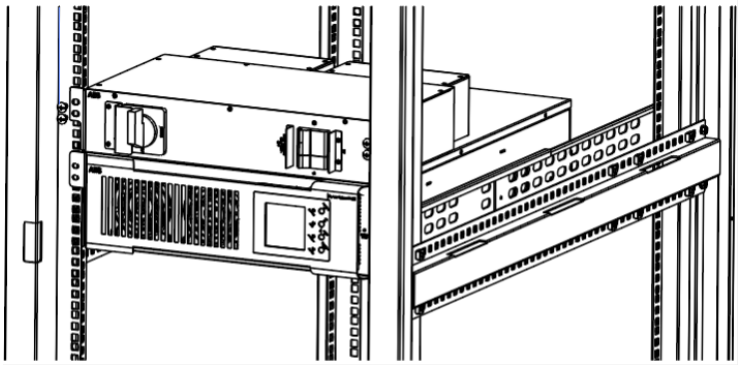
4.4.2-1
Rack Installation



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4.4.2-1

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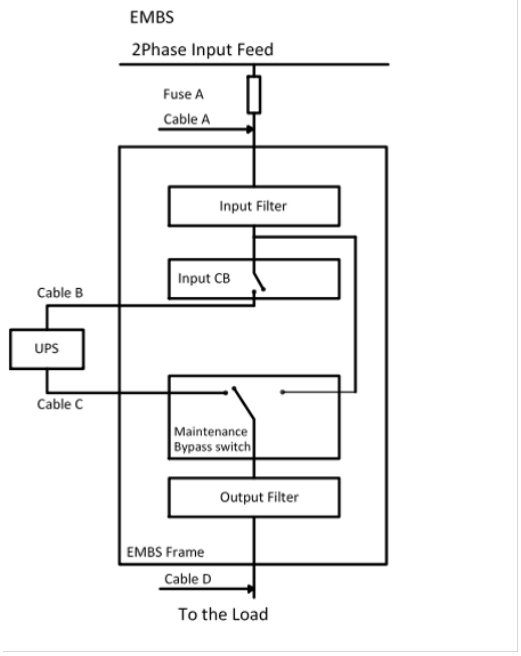
4.4.3 Initial Setup

The Installation and wiring must be performed in accordance with the local electric laws/regulations and execute the following instructions by professional personnel.

1) Make sure the mains wire and breakers in the building are enough for the rated capacity of UPS to avoid the hazards of electric shock or fire.

NOTE	DO NOT USE THE WALL RECEPTACLE AS THE INPUT POWER SOURCE FOR THE UPS, AS ITS RATED CURRENT IS LESS THAN THE UPS'S MAXIMUM INPUT CURRENT. OTHERWISE, THE RECEPTACLE MAY BE BURNED AND DESTROYED.

2) Switch off the mains switch in the building before installation.
3) Turn off and shut down the connected UPS.
4) Prepare wires based on the following drawing and table:



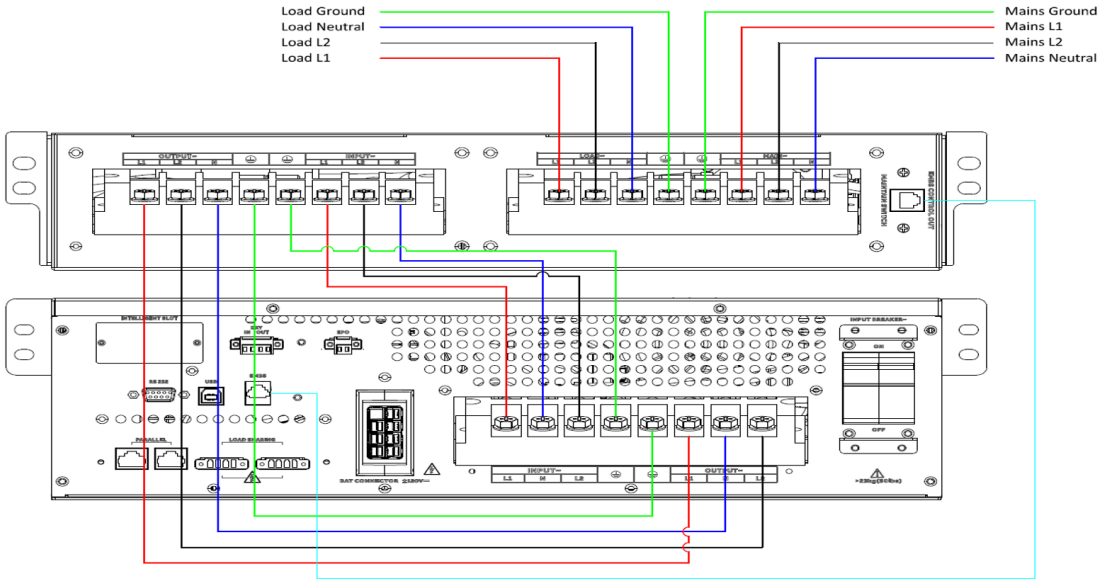
	5K/6K	8K/10K
Cable A [L1,L2,N,PE]	4*10AWG	4*8AWG
Cable B [L1,L2,N,PE]	4*10AWG	4*8AWG
Cable C [L1,L2,N,PE]	4*10AWG	4*8AWG
Cable D [L1,L2,N,PE]	4*10AWG	4*8AWG
Fuse A or Breaker	40A	63A

5) Remove the terminal block cover on the rear panel of the module. Then connect the wires according to the following terminal block diagrams:

4.4.4 Connect UPS and External Maintenance Bypass Switch Module

Remove the terminal block cover on the rear panel of the module. Then connect output terminals of UPS to output terminals of switch module. Connect utility input terminals of UPS to UPS input terminals of switch module. Connect signal slots of UPS and switch module with control signal cable attached to the package.

Refer to the following terminal block diagrams:



NOTE

MAKE SURE THAT THE WIRES ARE CONNECTED TIGHTLY WITH THE TERMINALS. PUT THE TERMINAL BLOCK COVER BACK TO THE REAR PANEL.

5 Service operation

5.1 Transfer to Maintenance Bypass

To transfer to maintenance bypass from UPS, follow the steps below:

Step 1: Press “OFF” button of UPS unit to transfer to bypass mode.

Step 2: Open the maintenance switch cover. If step 1 is not executed first, then UPS unit will transfer to bypass mode automatically with control output signal connection when opening the maintenance switch cover.

Step 3: Transfer rotary switch to “BPS” position and switch off UPS input breaker on the module. Then, all devices are directly powered by utility and there is no current through the UPS. The output and input of UPS are isolated from the system. You may now service or maintain the UPS by shutting down the batteries of UPS.

5.2 Transfer to UPS Protection

After maintenance service is done, follow below steps to transfer back to UPS operation.

Step 1: Switch on the input breaker of the module and reconnect UPS battery input breaker. Then UPS will enter to bypass mode.

Step 2: Transfer rotary switch to “UPS” position. Then, all devices are powered by utility through UPS bypass mode.

Step 3: Close back maintenance switch cover and press “ON” button of UPS unit. Then, all devices are protected by the UPS.

NOTE	IF MAINTENANCE WILL BE EXECUTED IN ANOTHER PLACE, BEFORE REMOVING THE UPS AND THE MODULE, PLEASE FOLLOW STEPS OF “TRANSFER TO MAINTENANCE BYPASS” AND THEN DISCONNECT ALL WIRES BETWEEN UPS AND THE MODULE FOR COMPLETE ISOLATION

6 Specification

Power Module model list

Model	Rated power
EMBS	10000VA

Weight and dimensions

Model	Weight	Dimensions W x H x D
EMBS without package	5.35 kg / 11.8 lbs	248 x 88 x 438mm / 9.76 x 3.46 x 17.24 inch
EMBS with package	6.7 kg / 14.8 lbs	482 x 202 x 508 mm / 18.98 x 7.95 x 20 inch

Electrical

	5K/6K/8K/10K
Rated input voltage	400 Vac
Rated output voltage	400 Vac
Frequency	50 Hz/60 Hz (Auto sensing)
Maintenance Switch Rating	63A 440Vac
Breaker Rating	63A 400Vac (ABB S203-D63 3P 63A)
Isolation grade	Class B

Environment and safety

ESD	IEC 61000-4-2 Level 3
Low Frequency Signals	IEC 61000-2-2
RS	IEC 61000-4-3 Level 3
EFT	IEC 61000-4-4 Level 3
Surge	IEC 61000-4-5 Level 2 (Line-line) IEC 61000-4-5 Level 3 (Line-Earther)
CS	IEC 61000-4-6 Level 3
Power Frequency Magnetic Field Immunity	IEC 61000-4-8 Level 4
Conducted	FCC CFR 47 Part 15 Class A
Radiated	FCC CFR 47 Part 15 Class A
Safety	UL 1778, CSA 107.3
Transportation	IEC 60068-2-31
	IEC 60068-2-64
	IEC 60068-2-27
Agency markings	UL
Operating temperature	0°C to 40°C / 32°F-104°F
Storage temperature	-15°C to 60°C / 5°F-140°F
Transit temperature	-25°C to 55 °C (-13°F to 130°F)
Relative humidity	5% to 95% no condensation
Operating altitude	<1000m (3281ft) for Nominal power, Over 1000m (3281ft) the power de-rating is 1% every 100m (328ft)
Transit altitude	Up to 4000 meters (13123 ft) above sea level
Mininun Clearances from other cabinet	25cm (1inch) for front and rear side 0cm for left and right side
IP grade	IP20
Audible noise	< 50 dB

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