User manual

Battery cabinet for PowerValue 11/31T

Document information

File name	:	4NWP101805R0001_OPM_ABB_PVA11-31-T_BAT_CAB_EN_REV-B.docx
Model	:	Battery cabinet PowerValue 11/31T-96
Date of issue	:	16.11.2016
Article number	:	4NWP100119R0002
Document number	:	4NWD003001
Revision	:	B

Foreword

This user manual contains guidelines to install the battery cabinet and it is intended for people who plan the installation, install, commission and use or service the battery cabinet. The reader is expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols

This manual contains important instructions that should be followed during installation and operation of the battery cabinet. This product is designed for commercial / industrial use only, with UPS systems. It is not intended for use with life support and other designated critical devices.

The battery cabinet has been designed for 12VDC x 9 Ah batteries within precise specifications. It's highly recommended to make use only of the batteries provided within the following articles:

ABB ordering code	Description
4NWP100119R0003	Batt.cabinet PowerValue 11/31T-96 w/batt
4NWP100119R0004	Batt.cabinet PowerValue 11/31T-48 w/batt

ABB Power Protection SA declines any kind of responsibility in the occurrence other batteries than the recommended ones are installed into the battery cabinet

Batteries contain dangerous substances that will harm the environment if thrown away. If you change the batteries yourself, call qualified organizations for battery disposal and recycling.

COMMISSIONING AND OPERATIONS INSIDE THE BATTERY CABINBET MUST BE PERFORMED BY A CERTIFIED SERVICE ENGINEER FROM THE MANUFACTURER OR FROM AN AGENT CERTIFIED BY THE MANUFACTURER.

BY NOT FULFILLING THIS OBLIGATION, THE PRODUCT MAY LOSE ITS WARRANTY

Contents

1 Safety rules

1.1 Warning notice system

WARNING	SEVERE INJURY AND/OR SERIOUS DAMAGE TO THE SYSTEM WILL RESULT IF PROPER PRECAUTIONS ARE NOT TAKEN
CAUTION	MINOR INJURY AND/OR DAMAGE TO THE PRODUCT MAY RESULT IF PROPER PREACAUTIONS ARE NOT TAKEN
NOTE	REFER TO THE USER MANUAL TO AVOID PROPERTY DAMAGE

1.2 Safety symbols

	SAFETY WARNING: THIS SYMBOL IS USED TO WARN THE USER ABOUT WARNINGS, CAUTIONS AND NOTES
	DANGER: THIS SYMBOL IS USED IN THE OCCURRENCE OF ELECTRICAL LIVE PARTS WITH HAZARDOUS VOLTAGE

1.3 Safety instructions

 DANGER!  WARNING!	OPERATIONS INSIDE THE BATTERY CABINET MUST BE PERFORMED BY A SERVICE ENGINEER FROM THE MANUFACTURER OR FROM AN AGENT CERTIFIED BY THE MANUFACTURER

 DANGER!  WARNING!	THE BATTERY CABINET OPERATES WITH MAINS, BATTERY OR BYPASS POWER THAT CARRY HIGH CURRENTS AND VOLTAGES. IT CONTAINS COMPONENTS THAT CARRY HIGH CURRENTS AND VOLTAGES

 DANGER!  WARNING!	KEEP OUT OF BATTERY POLES WHICH CONTAIN DANGEROUS DC-VOLTAGES CAUSING FATAL ACCIDENTS

 DANGER!  WARNING!	THE BATTERIES POSITIVE AND NEGATIVE ELECTRODES SHALL NOT TOUCH METAL; PLACE BATTERIES ON NOT METALLIC SURFACES IN ORDER TO AVOID ANY SHORT CIRCUIT HAZARD

 DANGER!  WARNING!	A BATTERY CAN PRESENT A RISK OF ELECTRICAL SHOCK AND HIGH SHORT CIRCUIT CURRENT. THE FOLLOWING PRECAUTIONS SHOULD BE OBSERVED WHEN WORKING ON BATTERIES: • REMOVE WATCHES, RINGS OR OTHER METAL OBJECTS • MAKE USE OF PROPER PPE (PERSONAL PROTECTION EQUIPMENT) AS PER LOCAL POLICIES AND RULES ➢ WEAR FLAME/ARC RESISTANT WHOLE BODY CLOTHING ➢ WEAR SUITABLE VOLTAGE RATED GLOVES ➢ USE SAFETY DIELECTRIC FOOTWEAR ➢ WEAR ARC FLASH FACE SHIELD ➢ USE VOLTAGE RATED TOOLS • DO NOT LAY TOOLS OR METAL PARTS ON TOP OF BATTERIES • DISCONNECT THE CHARGING SOURCE PRIOR TO CONNECTING OR DISCONNECTING BATTERY TERMINALS

 DANGER!  WARNING!	THE BATTERY CABINET MUST BE GROUNDED TO EARTH AND IP 20 RATED AGAINST ELECTRICAL SHOCK AND FOREIGN OBJECTS

 DANGER!  WARNING!	DETERMINE IF BATTERY IS INADVERTENTLY GROUNDED. IF INADVERTENTLY GROUNDED, REMOVE SOURCE FROM GROUND. CONTACT WITH ANY PART OF A GROUNDED BATTERY CAN RESULT IN ELECTRAL SHOCK. THE LIKELIHOOD OF SUCH SHOCK CAN BE REDUCED IF SUCH GROUNDS ARE REMOVED DURING INSTALLATION AND MAINTENANCE (APPLICABLE TO EQUIPMENT AND REMOTE BATTERY SUPPLIES NOT HAVING GROUNDED SUPPLY CIRCUIT)

 DANGER!  WARNING!	PARALLEL BATTERY CABINETS OR UPS INTERNAL BATTERIES MAY PRESENT VOLTAGE AT TERMINALS OF A BATTERY CABINET UNDER SERVICE. MAKE CERTAIN ALL POLES OF THE BATTERY CABINET DISCONNECTION DEVICES ARE OPEN BEFORE UNDERTAKING INTERNAL SERVICE ACTIVITY

 DANGER!  WARNING!	MAKE CERTAIN ALL DISCONNECTION DEVICES OF INSTALLED BATTERIES ARE OPEN BEFORE CONNECTING OR DISCONNECTING AN ADDITIONAL BATTERY CABINET TO THE BATTERY VOLTAGE BUS

 DANGER!  WARNING!	RISK OF EXPLOSION IF USING AN INCORRECT BATTERY TYPE

 DANGER!  WARNING!	DO NOT DISPOSE OF BATTERIES IN A FIRE. THE BATTERY MAY EXPLODE

 DANGER!  WARNING!	DO NOT OPEN OR MUTILATE BATTERIES. RELEASED ELECTROLYTE IS HARMFUL TO THE SKIN AND EYES. IT MAY BE TOXIC

 CAUTION!	DO NOT EXCEED BATTERY CABINETS OR UPS RATING LABELS

 CAUTION!	THE BATTERY CABINET AND THE BATTERIES ARE HEAVY AND MAY TIP DURING TRANSPORTATION IF UNPACKING INSTRUCTIONS ARE NOT CLOSELY FOLLOWED

 CAUTION!	SEALED BATTERIES MUST NEVER BE STORED IN A DISCHARGED OR PARTIALLY DISCHARGED STATE

 CAUTION!	EXTREME TEMPERATURE, UNDER- AND OVERCHARGE AND OVERDISCHARGE WILL DESTROY BATTERIES

 NOTE!	AS THE BATTERY LIFE DEPENDS ON THE AMBIENT TEMPERATURE, FOR THE UPS SYSTEM IT IS RECOMMENDED TO HAVE A LOCATION WITH CLIMATE-CONTROLLING SYSTEM

 NOTE!	TO ENSURE AN OPTIMUM OPERATION OF THE UPS SYSTEM AND A CONTINUOUS AND EFFICIENT PROTECTION OF THE CONNECTED LOAD IT IS RECOMMENDED TO CHECK THE BATTERIES EVERY 12 MONTHS

2 Unpacking

Upon receiving the battery cabinet, carefully examine the packing container for any sign of physical damage. In case of damage, notify immediately the carrier.

The packing container of the battery cabinet protects it from mechanical and environmental damage. Preserve the packaging for later re-use.

2.1 Preparation

1. Remove the two side and upper panel covers from the unit. (fig. 1)

2. Remove the metal bars (fig. 2)

Fig. 1

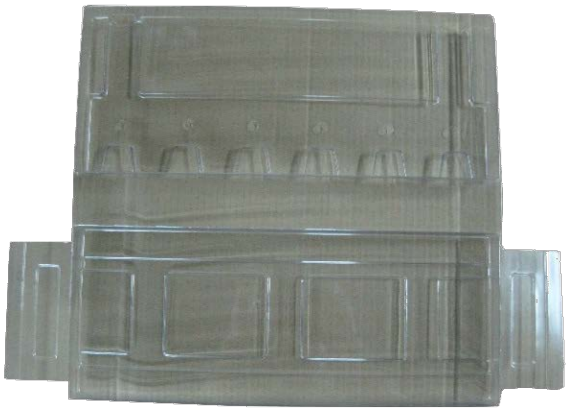
Fig. 2

3. Extract the battery plastic trays and the two packages with cables (fig.3)

Fig. 3

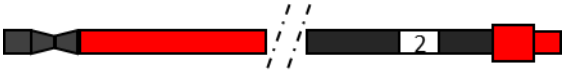
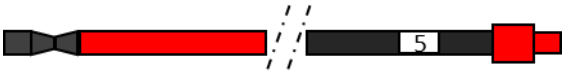
2.2 Battery trays

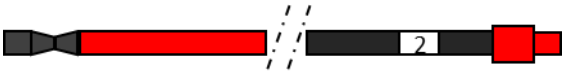
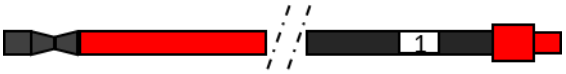
Check the internal battery plastic correspond to the following unpacking list:

TRAY	PICTURE	NR.OF BATTERIES	Q.TY	DESTINATION SHELVES
TRAY A		6	8	C1..C4 / D1..D4
TRAY B		8	6	A1..A3 / B1..B3

2.3 Cabling kits

Check all cables correspond to the following unpacking list:

KIT #1			
Description	Drawing	Length (cm)	Quantity (pcs)
CABLE 1-A		10	40
CABLE 1-B		27	4
CABLE 1-C		27	4
CABLE 1-D		65	4
CABLE 1-E		65	4
STICKERS			8
CABLE TIES			16

KIT #2			
Description	Drawing	Length (cm)	Quantity (pcs)
CABLE 2-A		10	42
CABLE 2-B		27	3
CABLE 2-C		27	3
CABLE 2-D		75	3
CABLE 2-E		75	3
STICKERS			6
CABLE TIES			12

3 Installation

For a correct installation and cabling of the battery cabinet, please follow step by step the instructions described below
The instructions refer to the installation of the maximum amount of batteries that may fit in the battery cabinet (96 batteries, distributed in 4x24 strings); for using 48 batteries only please refer to Appendix A

3.1 Battery cabinet shelves overview

The scheme of battery cabinet's shelves is the following. (fig.4)

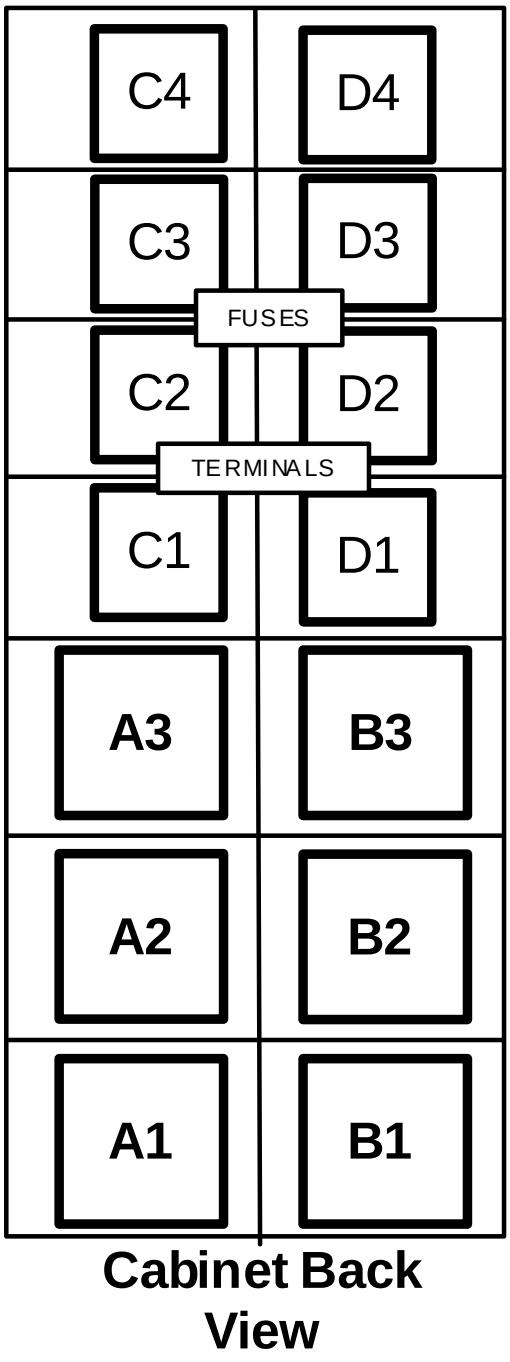


Fig. 4

3.2 Battery wiring

Refer in each moment to the electrical scheme at section 3.

Insert 6 batteries in the trays type A and 8 batteries in the trays type B as shown in the following pictures

Fig. 5

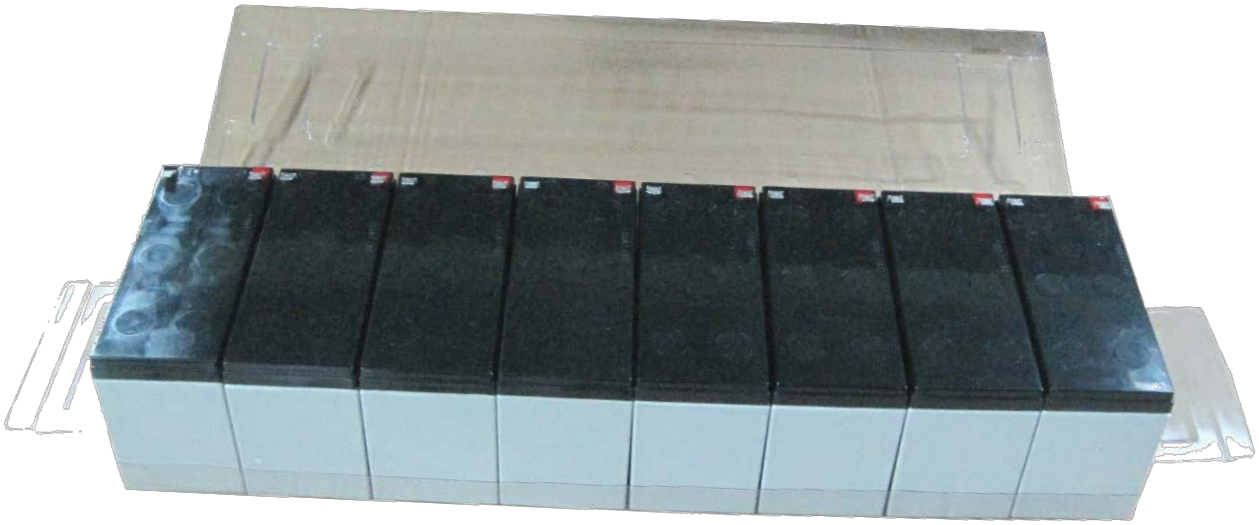


Fig. 6

Thus, connect the batteries in each tray in series by means of cables 1-A or 2-A, as shown below:

Fig. 7

Fig. 8

For shelves A1..A3, connect the cables 1-C or 2-C and 2-D as following:

Fig. 9

For shelves B1..B3, connect the cables 2-E and 1-B or 2-B as following:

Fig. 10

For shelves C1..C4, connect the cables 1-C or 2-C and 1-D as following:

Fig. 11

Finally, for shelves D1..D4, connect the cables 1-E and 1-B or 2-B as following:

Fig. 12

For each tray, make use of the provided cable ties to secure tightly the cables
Close the lid of each tray, eventually make use of the provided stickers for a better result:

A1..A3

Fig. 13

B1..B3

Fig. 14

C1..C4

Fig. 15

D1..D4

Fig. 16

3.3 Placing batteries in the cabinet

Place each tray in the correspondent shelf

A1..A3

Fig. 17

B1..B3

Fig. 18

C1..C4

Fig. 19

D1..D4

Fig. 20

Place back the side metal bars for both sides, making sure the cables run through the holes, as shown below:

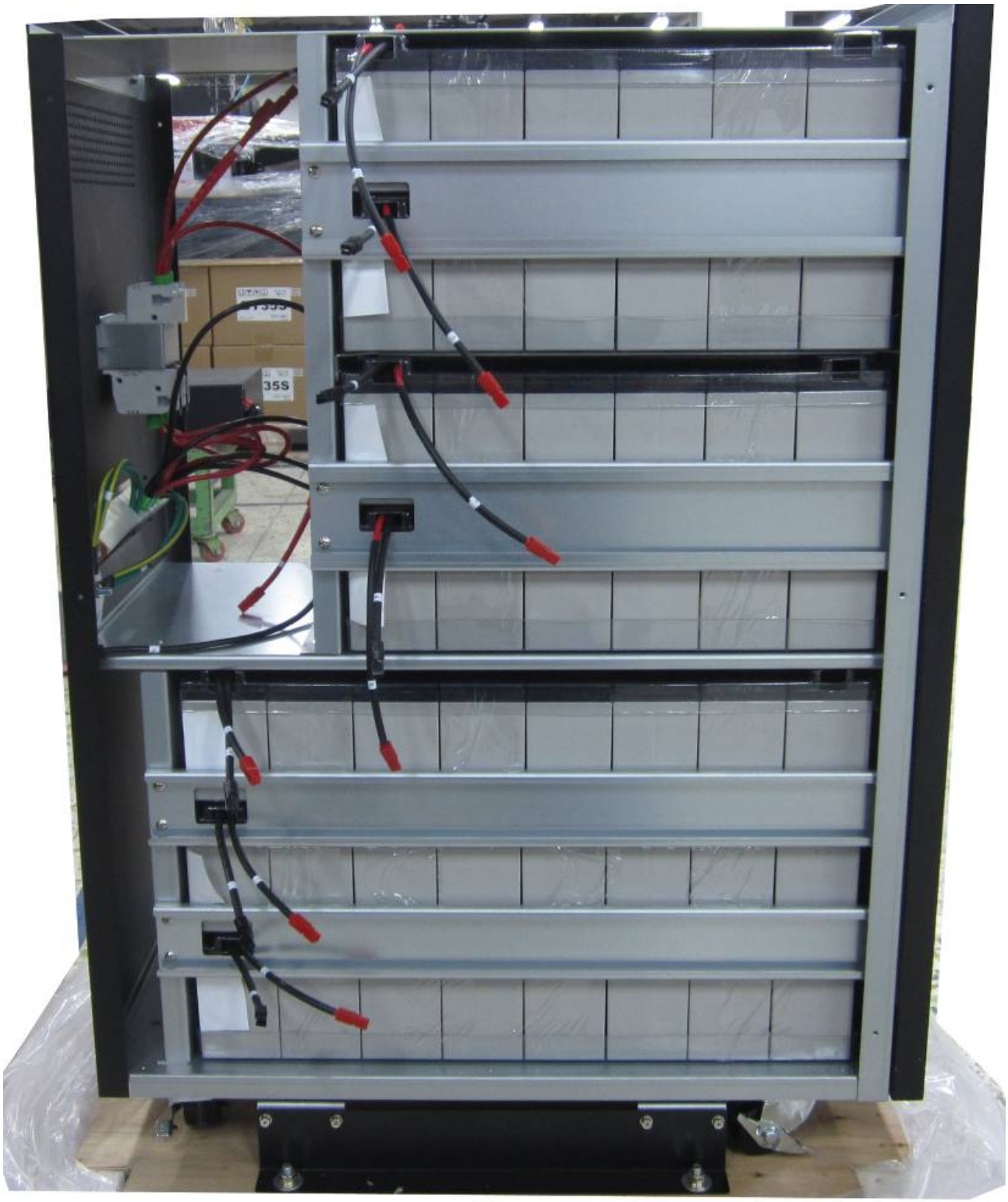


Fig. 21

3.4 String creation and final wiring

Refer in each moment to the electrical scheme at section 3

First create the series A1..A3 / B1..B3 / C1..C4 / D1..D4, each made by 24 battery blocks, as shown below:

Fig. 22

Thus, connect the above 4 strings in parallel according to the electrical scheme at section 3.

Fig. 23

3.5 Test

By means of a digital multimeter check the correct voltage of the unit that should be ≥ 288 VDC.

Fig. 24

If the test is successful, place back the side and top covers; it's now possible to connect the battery cabinet to a 11/31T UPS system according the correct procedure (see PowerValue 11/31T User Manual for further details)

4 Electrical scheme

Battery arrangement (4x24) x 9Ah

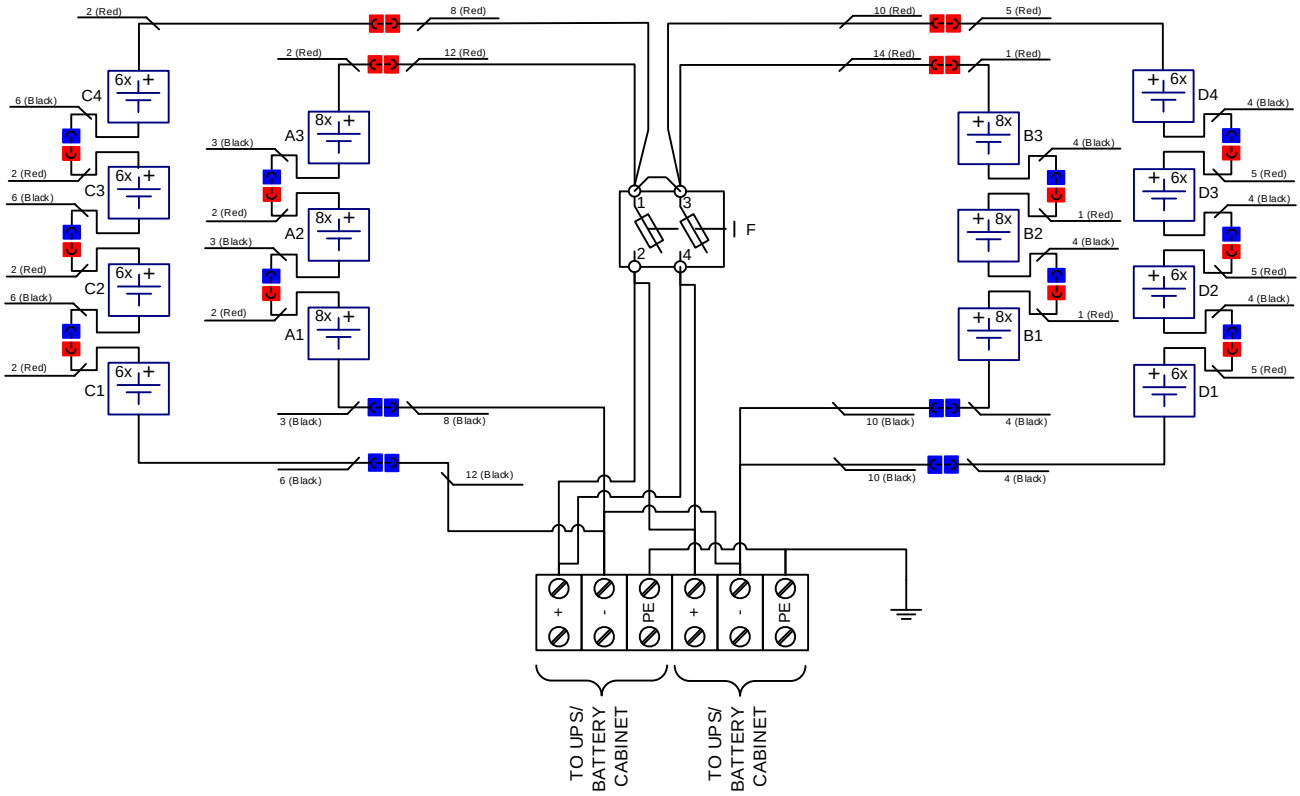
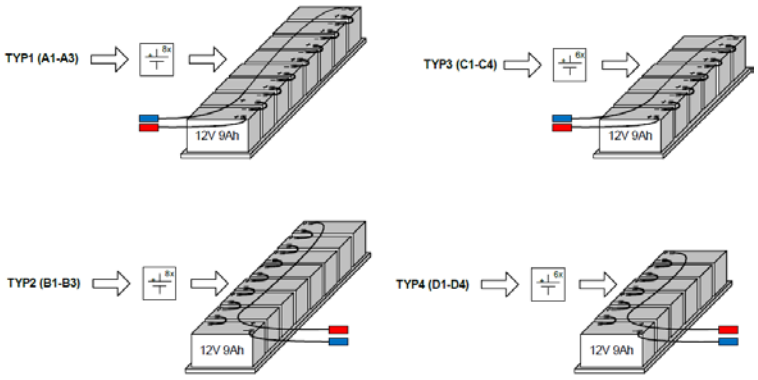


Fig. 25



	A	B	C	D
4			TYP 3	TYP 4
3	TYP 1	TYP 2	TYP 3	TYP 4
2	TYP 1	TYP 2	TYP 3	TYP 4
1	TYP 1	TYP 2	TYP 3	TYP 4

Fig. 25

5 Appendix A

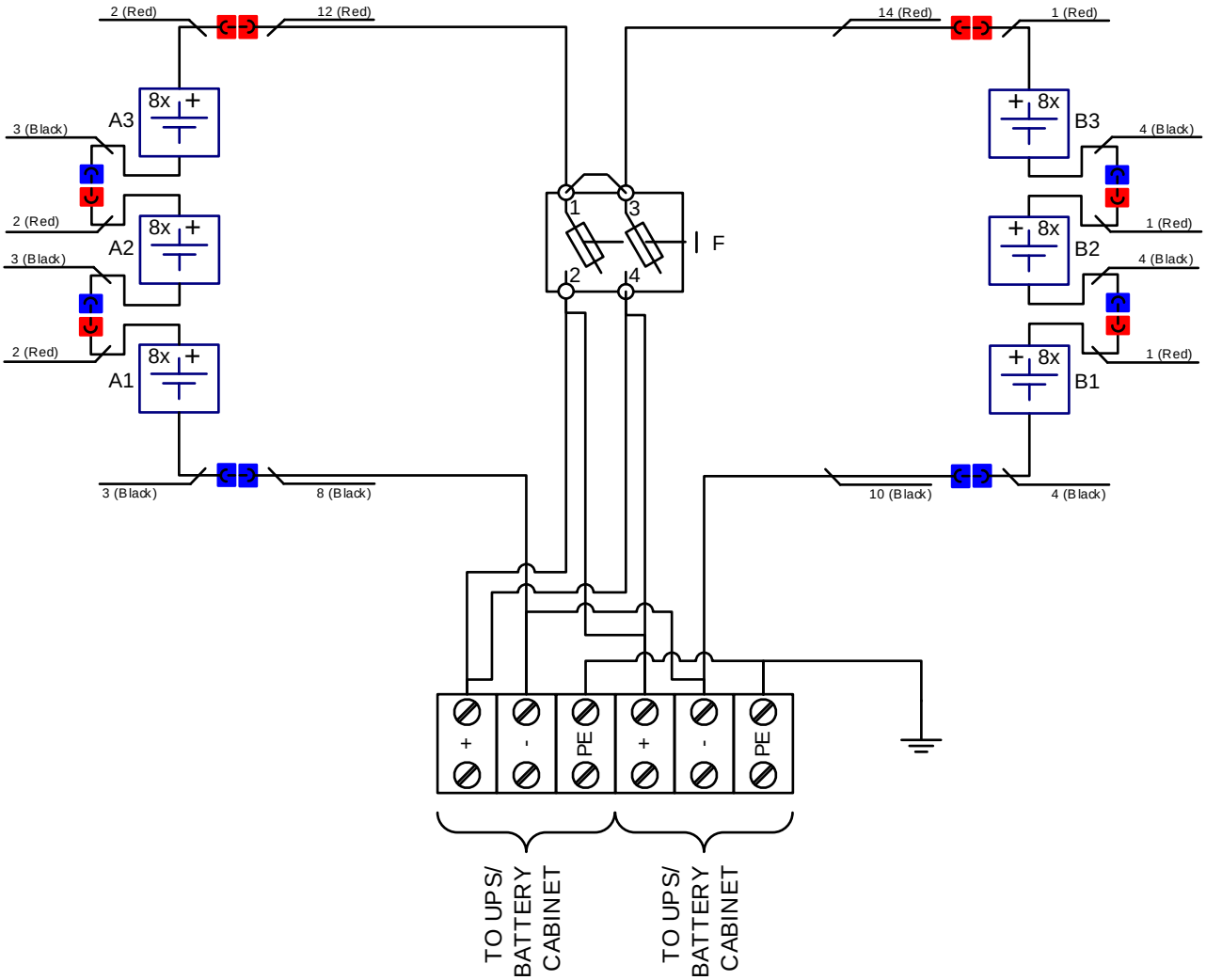
In case only 48 batteries (2x24 strings) have to be installed in the cabinet, such as for the following ABB product:

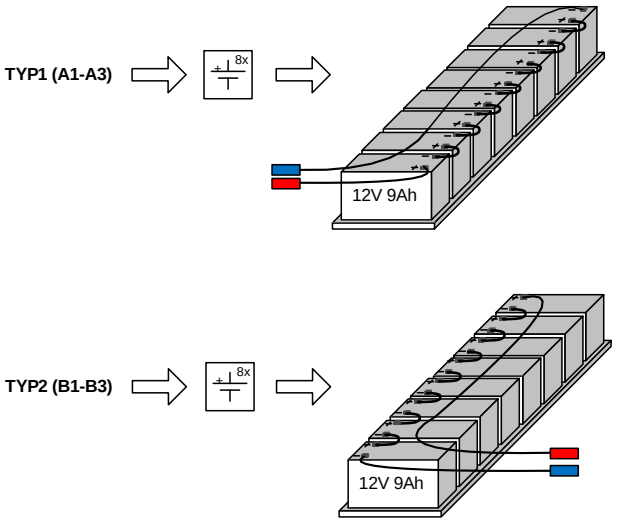
4NWP100119R0004	Batt.cabinet PowerValue 11/31T-48 w/batt

it's recommended to install the batteries only in the shelves A1..A3 and B1..B3

In this case the electrical scheme to which to refer is the following:

Battery arrangement (2x24) x 9Ah





	A	B
3	TYP 1	TYP 2
2	TYP 1	TYP 2
1	TYP 1	TYP 2

6 Technical specifications

Characteristic	Value
General data	Battery cabinet for PowerValue 11/31 T
Battery cabinet models	Battery cabinet PowerValue 11/31T-96
Max.nr. of UPS modules	-
Battery type	VRLA 9 Ah
Battery dimensions (WxHxD)	151x98x65 mm
Max.nr. of batteries	96
Nr. of batteries / string	24
Max.nr of strings	4
Battery placement	On Trays; 6 or 8 pcs / tray
Nominal DC voltage	288 V
DC fuse	2 x 50 A
Wiring terminal type	Terminals
Wiring terminals	2 x 10-25 mm2 + PE 1 x 10-25 mm2
Dimensions (wxhxd)	350 x 890 x 715 mm
Weight with trays w/o batteries	102 kg
Weight with trays and batteries	Approx. 361 kg
Feet	Wheels
Color	Panton Process Black C
UPS color	Panton Process Black C
Cables (UPS to batt cab)	1 m length; 10-25 mm2

Contact us

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