

# Phaseo power outage solution User guide

03/2008



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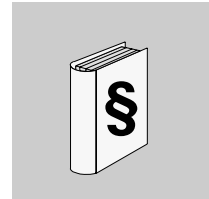
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# Safety Information



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## Important Information

### NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

### **DANGER**

DANGER indicates an imminently hazardous situation, which, if not avoided, **will result** in death or serious injury.

### **WARNING**

WARNING indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury, or equipment damage.

### **CAUTION**

CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

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**PLEASE NOTE**

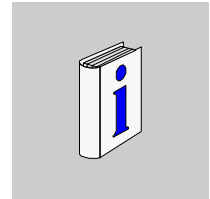
Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

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## About the Book



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### At a Glance

**Document Scope** This user manual contains the necessary information for the implementation of the Phaseo power outage solution.

### Related Documents

Title of Documentation	Reference Number
Phaseo Universal power supply instruction sheet	1489414_01
Battery Control module instruction sheet	1489436_01
Battery module instruction sheet	1489436_06

**User Comments** We welcome your comments about this document. You can reach us by e-mail at [techpub@schneider-electric.com](mailto:techpub@schneider-electric.com)

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# Overview



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## Overview

### Introduction

This chapter presents the constitutive elements of the Phaseo power outage solution.

### What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Overview of the solution	10
Presentation of Battery modules ABL 8BPK24A••	11
Presentation of Battery control modules ABL 8BBU24•00	12

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## Overview of the solution

### Introduction

The Phaseo power outage solution allows the 24 VDC supply of the installation (or with one part) in case there is a network voltage cut-off:

- During the entire duration of the cut-off, in order to allow :
  - the continuity of the installation service.
- During a limited time, in order to allow :
  - data backup,
  - the fallback of the actuators,
  - the startup of generators,
  - operating system shut-down,
  - data transmission by remote monitoring...

### Constitution of the solution



Marker	Description	Reference
1	Phaseo Universal power supply	ABL 8•P•24••0
2	Battery control module	ABL 8BBU24•00
3	Battery module	ABL 8BPK24A••

## ⚠ CAUTION

### RISKS OF EQUIPMENT DAMAGE

- When the supply is provided by the Battery module, the voltage is not regulated and can vary between 19 VDC and 28 VDC. It is suitable to check carefully that the supplied circuits can support a voltage tension between these 2 values.
- The use of batteries other than those included in the Battery modules ABL 8BPK24A•• is not possible (risk of battery deterioration).

**Failure to follow these instructions can result in injury or equipment damage.**

## Presentation of Battery Modules ABL 8BPK24A\*\*

### Introduction

Each Phaseo Battery module consists of:

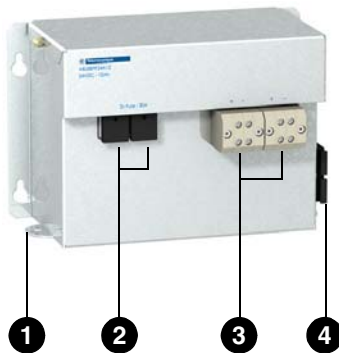
- 2 lead sealed batteries mounted serially,
- one fuse protection (automobile type).


The Phaseo Battery module range proposes 3 different battery capacities according to the backup time and the current required for the application desired. See *Choice of components*, p. 15.

**Note:** The Phaseo battery modules do not require maintenance. In the case of failure, please replace the module set.

### Description

The scheme below presents the structure of the Phaseo Battery module:



Marker	Description	3.2 Ah	7 Ah	12 Ah
1	Metal protective housing	Bolt mounting by vertical or horizontal panel		
		Rail mounting  (1)	-	
2	Protection fuse carrier and shutdown of module	1 fuse carrier		2 fuse carriers
3	Terminal block of the 24 VDC output voltage	1 block 10 mm <sup>2</sup> screw terminal block	2 blocks 10 mm <sup>2</sup> screw terminal block	
4	Fuse storage attachment	1 attachment		2 attachments

(1) Kit usage ABL 1A02

**Note:** The fuses are delivered with the module, but not mounted, please mount them by following the implementation. See *Implementation stages*, p. 19.

## Presentation of Battery control modules ABL 8BBU24•00

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### Introduction

The battery Control modules ABL 8BBU24•00 allowing the following functions :

- Optimize the use and life of the batteries:
  - charge if necessary and as a function of the ambient temperature,
  - shutdown of the Battery module before the deep discharge <sup>(1)</sup>,
  - maintenance charge to compensate for self-discharge,
  - measurement of Battery module ageing
- Automatic switch without interruption between power supply and battery:
  - adjustable operating time on the battery (holding time),
  - diagnostic of the system state.

The range of the Phaseo battery Control module consists of 2 modules according to the maximum usage current (20 A or 40 A). See *Choice of components*, p. 15.

<sup>(1)</sup>**Important:** When the Battery control module ABL 8BBU24•00 is not supplied by the power supply ABL 8RP••/ABL 8WP••, the Battery module ABL 8BPK24A•• continues to provide a residual current necessary for the power supply of the module electronics.

In the case of prolonged absence of the power supply voltage in the IN+ and IN- terminals, it is advisable to unplug the Battery module by removing its fuse(s) in order to avoid deep discharge.

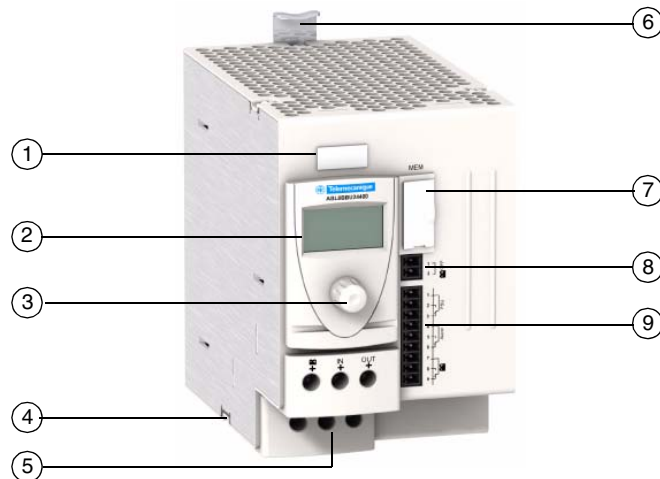
When this power-off is expected (machine transport or requested power-off), it is also recommended to turn on the entire control module and Battery module until the batteries are charged completely (battery icon OK on the display).

It is also possible to insert a contactor between the Battery module and the Battery control module in order to execute an automatic cut-off (see *Wiring of an auto power off circuit of the Battery Module*, p. 35).

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**Description**

The scheme below presents the structure of the Battery control module:



N°	Description
1	Click-on marker label
2	LCD display
3	Browse selection button
4	Grounded lug
5	24 VDC I/Os and the Battery module terminals
6	Mounting flange on DIN rail
7	Memory card (SR2 MEM02) slot to backup and copy configuration settings
8	2-point removable screw terminal block for the input terminal of the 'inhibition of the Battery module voltage'
9	9-point removable screw terminal block for the input terminal of diagnostic contacts (power supply presence, alarm and battery presence)



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## Choice of solution components

# 2

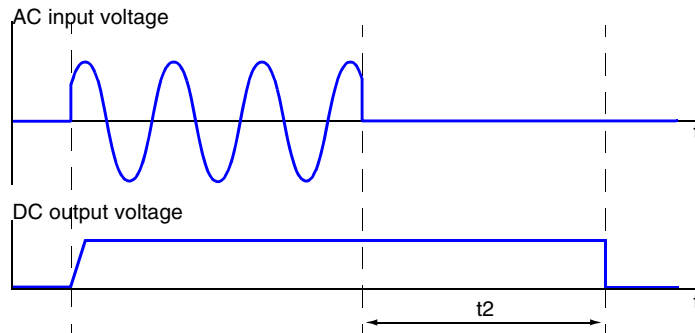
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### Choice of components

#### Introduction

The application settings to be considered in the component choice are :

- the current to be provided during  $t_2$  backup (holding current),
- the  $t_2$  backup time (see timing diagram below).



#### Guidance in choosing

According to the necessary holding current and desired backup time, the table below indicates the associations of appropriate modules.

**Note:** This table is based on the characteristics of new Battery module. At the end of life, once the autonomy of a battery is capable of being divided by 2, it is suitable to take this into account when choosing the module(s) by multiplying the holding time by 2 if desired to guarantee the holding time during the life of the modules. For backup times greater than 5 hours, refer to the table on the following page.

Holding current	t2 holding time (see timing diagram)																										
	Seconds										Minutes										Hours						
	0.1	0.2	0.5	1	2	5	10	30	1	2	3	4	5	6	7	8	9	10	15	20	30	40	50	1	2	3	5
1 A	1					2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
2 A	1					2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	4	4
3 A	1				2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	4	4	5
4 A	1				2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	4	5	5
5 A	1			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	4	4	5	5	
6 A	1			2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	4	4	4	4	5	5	
7 A	1			2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5		
8 A	1			2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	5	5		
10 A	1		2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	5	5	5				
15 A	1		2	2	2	2	2	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5					
20 A	1		3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	5	5	5							
25 A	1	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7	8	8	8	8							
30 A	1	6	6	6	6	6	6	6	6	6	7	7	7	8	8	8	8	8	8								
35 A	1	6	6	6	6	6	6	6	6	7	7	7	8	8	8	8	8	8									
40 A	1	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8										

**Note:** Data for an ambient temperature of 20°C (68°F), the capacity of a battery increases with temperature.

Associations proposed:

Code	Module		Battery module		
	Type	Reference	Qty.	Type	Reference
1	40 A Buffer Module <sup>(1)</sup>	ABL 8BUF24400	-	-	ABL 8BUF24400
2	20 A Battery Control	ABL 8BBU24200	1	3.2 Ah	ABL 8BPK24A03
3			1	7 Ah	ABL 8BPK24A07
4			1	12 Ah	ABL 8BPK24A12
5			2	12 Ah	ABL 8BPK24A12
6	40 A Battery Control	ABL 8BBU24400	1	7 Ah	ABL 8BPK24A07
7			1	12 Ah	ABL 8BPK24A12
8			2	12 Ah	ABL 8BPK24A12

<sup>(1)</sup> Solution for microbreaks (< 2 s), for more information please consult the catalog.



**Discharge current**

The following table indicates the likely discharge current (in A) as a function of the desired holding time and the capacity of the Battery module:

Battery module capacity	t2 holding time (see timing diagram)															
	Minutes									Hours						
	5	10	15	20	25	30	35	40	45	1	2	3	5	8	10	20
3.2 Ah	8.4	6.3	4.9	4.2	3.6	3.1	2.8	2.6	2.3	2.0	1.1	0.86	0.50	0.38	0.30	0.16
7 Ah	18.2	13.6	11.0	9.0	7.7	6.8	6.1	5.6	5.0	4.2	2.5	1.8	1.2	0.80	0.64	0.35
12 Ah	31.3	23.4	18.6	15.5	13.3	11.6	10.5	9.6	8.6	7.1	4.2	3.1	2.0	1.3	1.1	0.60

**Note:** Data for an ambient temperature of 20°C (68°F).

**Note:** The holding times are multiplied by the number of parallel Battery modules (3 MAXI).



## Implementation stages

# 3

### Implementation stages

**Operation to be followed** To implement the Phaseo power outage solution proceed as follows:

Stage	Action	See
1	Check that the products commissioned correspond to commanded references.	<i>Choice of solution components, p. 15</i>
2	Cut the primary power supply network.	-
3	Install the Phaseo power supply.	Service instruction delivered with the Phaseo power supply, ( <i>Related Documents, p. 7</i> ).
4	Install the Battery control module.	<i>Mounting of Battery control module, p. 26</i>
5	Install the power supply. <ul style="list-style-type: none"><li>● connect the power supply to the network protection,</li><li>● wire, if necessary, the diagnostics relay,</li><li>● place the power supply switch to the MANU restart mode.</li></ul>	Service instruction delivered with the Phaseo power supply, ( <i>Related Documents, p. 7</i> ).
6	Install the Battery module(s). Do not plug in the fuse(s) for the moment.	<i>Mounting of the Battery module, p. 22</i>
7	Wiring: <ul style="list-style-type: none"><li>● connect the Battery control module and the Battery module(s).</li><li>● wire, if necessary, the 9-point terminal block of the Battery control module.</li></ul>	<ul style="list-style-type: none"><li>● <i>24 VDC circuit wiring, p. 28</i></li><li>● <i>Diagnostics contact and inhibition input wiring, p. 33</i></li></ul>
8	Plug in the fuse(s) of the Battery module, then turn on the power supply. <b>Note</b> : A light sparkle may appear when plugging in the fuses. This is not a failure.	-
9	Adjust and check the power supply: <ul style="list-style-type: none"><li>● adjust, if necessary, the output voltage,</li><li>● check that the 2 lights are green.</li></ul>	Instruction sheet delivered with the Phaseo power supply, ( <i>Related Documents, p. 7</i> ).

Stage	Action	See
10	Set up the Battery control module.	<i>First powering on / Minimum setup, p. 40</i>
11	Wait for full charge of the Battery module before carrying out a network outage test (up to 72h for a first commissioning).	-
12	Check that the screen of the Battery control module is green. It is possible to check also the information provided by the output relays of the 9-point terminal block.	<i>Diagnostic, p. 51</i>

 **CAUTION**

**RISK OF EQUIPMENT DAMAGE**

The power supply ABL 8•P must be configured in the manual reset mode (selector on MANU). If the power supply is configured in the automatic reset mode (AUTO), the Battery control module can be destroyed in the case of overcurrent in its output.

**Failure to follow these instructions can result in injury or equipment damage.**

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# Assembly and temperature conditions

# 4

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## Presentation

### Introduction

This chapter presents the assembly and assembly conditions to be considered in the installation of Battery modules and the Battery control module.

### What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Mounting of the Battery module	22
Mounting of Battery control module	26

## Mounting of the Battery module

---

### Important

Install the Battery module(s) in the freshest possible location. This prolongs their life (see *Lead Battery Generalities*, p. 76).

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### Choice of mounting

Depending on the temperature inside the enclosure, the following mountings are recommended:

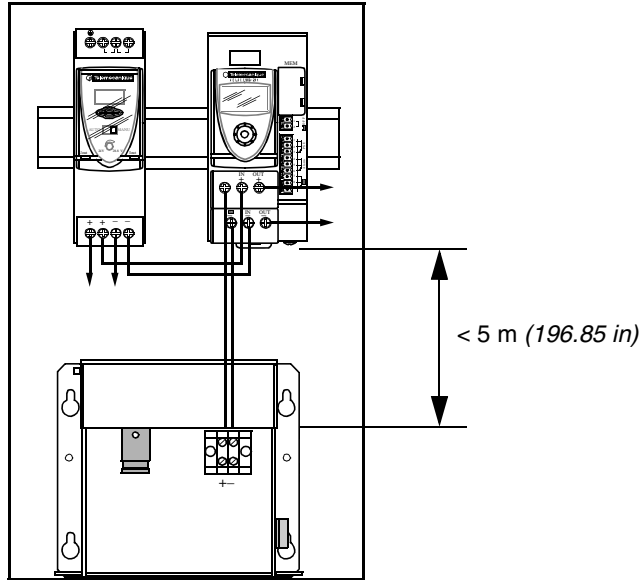
Temperature inside the enclosure = T	Mounting
$T \leq 40\text{ }^{\circ}\text{C}$ (104°F)	Battery module inside the enclosure
$T > 40\text{ }^{\circ}\text{C}$ (104°F) (No regulation of the temperature inside the enclosure)	Battery module outside the enclosure

**Note:** The mounting with the Battery module inside the enclosure is favored in order to allow the charge to be corrected as a function of temperature.

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**Mounting 1:**  
 **$T \leq 40^{\circ}\text{C}$  ( $104^{\circ}\text{F}$ )**

Battery module below the enclosure :

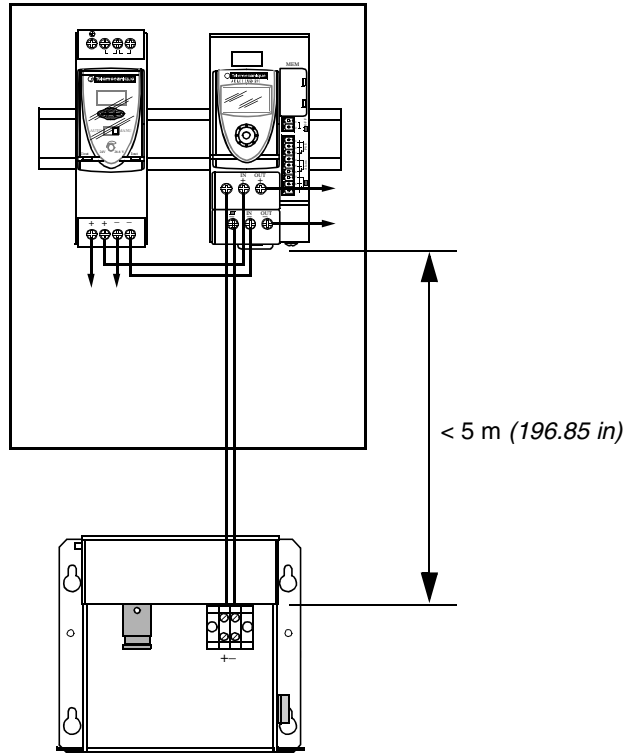


**Note:** The charge voltage is adjusted automatically as a function of the temperature measured by the control module.

**Note:** This mounting corresponds to the Battery module temperature setup in **Differential mode** (see *Battery module temperature*, p. 46).

**Mounting 2:**  
**T > 40°C (104°F)**

Battery module outside the enclosure, in a location where the temperature approximates 20°C (68°F):



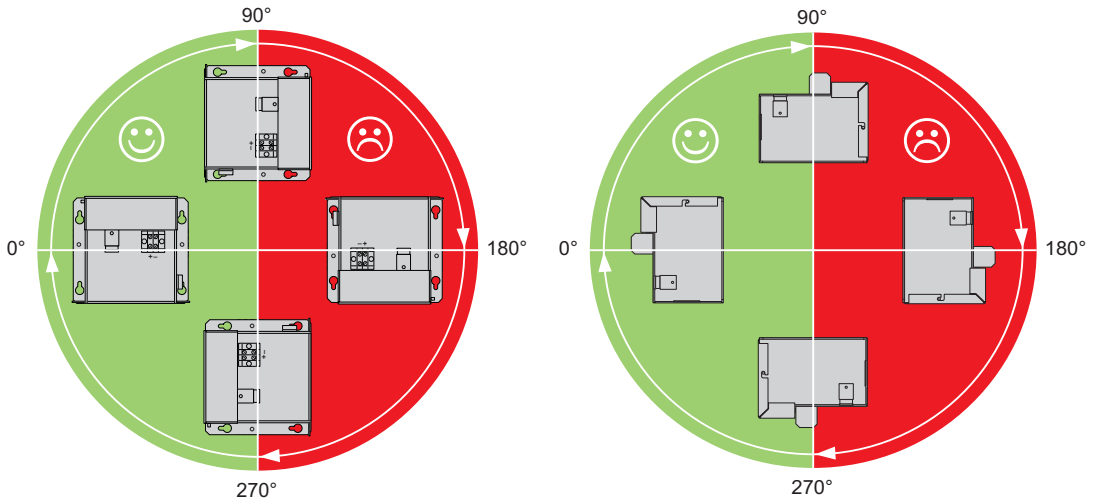
**Note:** This solution is only recommended if it is impossible to lower the temperature inside the enclosure (ventilation, climatization). There is no automatic charge voltage correction as a function of the temperature.

**Note:** This mounting corresponds to the Battery module temperature setup in **Absolute mode** (see *Battery module temperature*, p. 46).




**Mounting position**

The scheme below illustrates the positions to be considered during the mounting of the Battery modules:




**Dimensions and mounting**

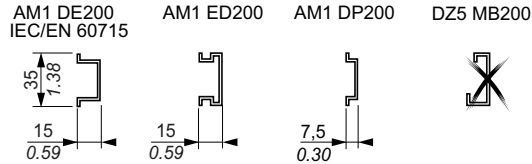
The Battery modules are mounted by screw or rail  for the module ABL 8BPK24A03.

The module dimensions and drilling templates of mounting holes are located in the instruction sheet of the Battery modules. See *Related Documents*, p. 7.

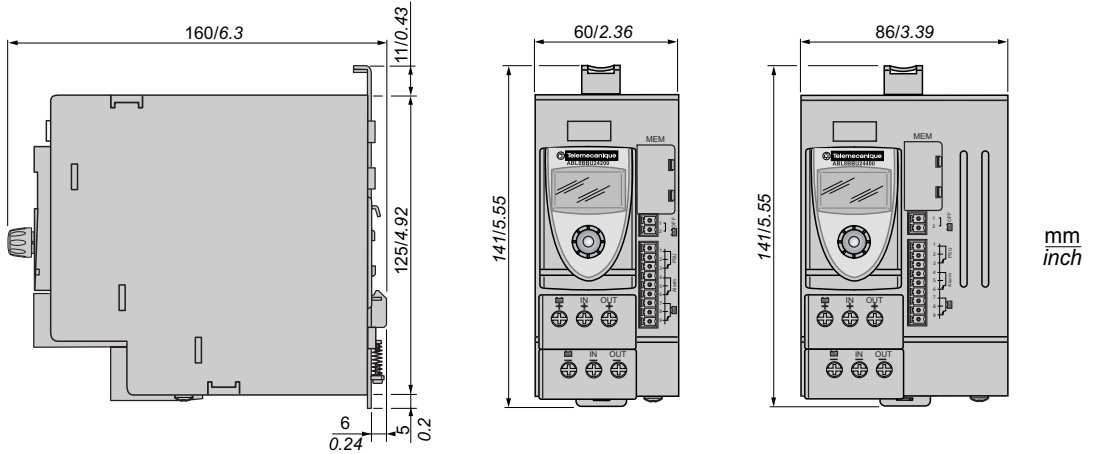
## Mounting of Battery control module

### Rail


The Battery control modules must be installed on a rail . The scheme below provides the characteristics and the references of the compatible rails for the mounting of the modules:

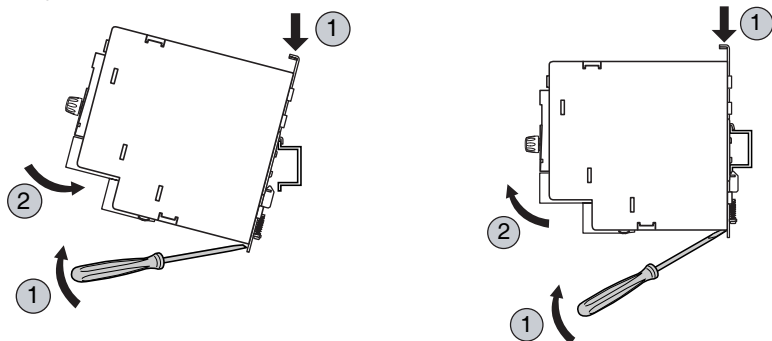


### Dimensions



### Mounting/ Dismantling

The scheme below illustrates the mounting (left) and the dismantling (right) of the Battery control module on a rail  :



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# Wiring

# 5

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## Overview

### Introduction

This chapter presents the elements necessary for the wiring of Battery modules and the Battery control module.

### What's in this Chapter?

This chapter contains the following topics:

Topic	Page
24 VDC circuit wiring	28
Diagnostics contact and inhibition input wiring	33
Wiring of an auto power off circuit of the Battery module	35

## 24 VDC circuit wiring

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### Preliminaries

 <b>CAUTION</b>
--

<b>RISKS OF EQUIPMENT DAMAGE</b>
----------------------------------

The input terminals of the Battery control module must, by obligation, be connected to the output terminals of the ABL8 supply or other Phaseo ABL8 modules.
--

<b>Failure to follow these instructions can result in injury or equipment damage.</b>
---

 <b>CAUTION</b>
--

<b>RISKS OF EQUIPMENT DAMAGE</b>
----------------------------------

- |  |
|--|
| <ul style="list-style-type: none"><li>● Consider the tightening torque indicated in this document to avoid hazardous terminal block warm-up.</li><li>● Do not allow liquids or foreign bodies to penetrate inside the product.</li></ul> |
|--|

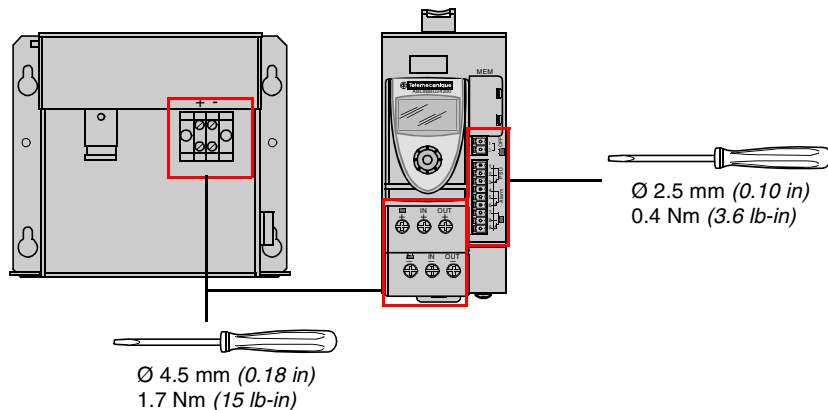
<b>Failure to follow these instructions can result in injury or equipment damage.</b>
---

Read carefully the regulations and recommendation of the following wiring :

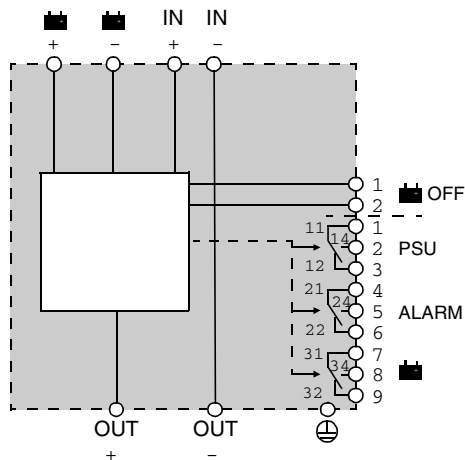
- Check that the operating and environmental conditions are well situated in the specified zones, see *Characteristics, p. 69*.
- As a function of the charge, a downstream protection circuit may be required. The selectivity module ABL 8PRP24100 fulfils this role.
- Use wire end ferrules for the wires.
- Use the wires in the appropriate section in order to consider the demands in current and voltage :
  - input and output of the Battery control module and the Battery module:  
0.5...10 mm<sup>2</sup> (AWG 20...8) with wire end ferrules.
- Connect the junction of the functional earth by means of a 10 mm<sup>2</sup> (AWG 6) section conductor.

**Tightening torque**

The scheme below indicates the screws to be used and the tightening torque to be considered:

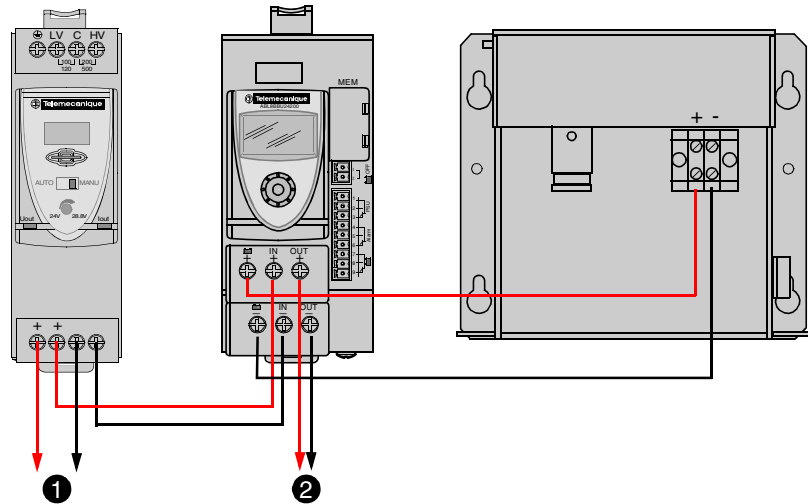


**Internal schemes**



**Note:** The IN- et OUT - terminals are internally relinked.

**Basic wiring**



N°	Description
1	Non-protected output
2	Protected output, for circuit requiring continuous supply in the case of primary network shut-off.

**Important:** The rated current delivered on the control module output may reach 20 A (ABL 8BBU24200) or 40 A (ABL 8BBU24400) in a prolonged manner, regardless of the current delivered by the supply.

**⚠ CAUTION**

**RISKS OF EQUIPMENT DAMAGE**

The polarities of the Battery module must be considered. A polarity inversion can lead to destruction or malfunction of the Battery module.

**Failure to follow these instructions can result in injury or equipment damage.**

**Maximal capacitive load on the supply output**

The non-protected circuits connected directly to the supply (marker 1) must have a capacitive load less than the values in the table below:

Power Supply	Maximal capacity of the non-protected load ( $\mu\text{F}$ )
ABL 8RPS24030	30,000
ABL 8RPS24050	50,000
ABL 8RPS24100	100,000
ABL 8RPM24200	100,000
ABL 8WPS24400	100,000

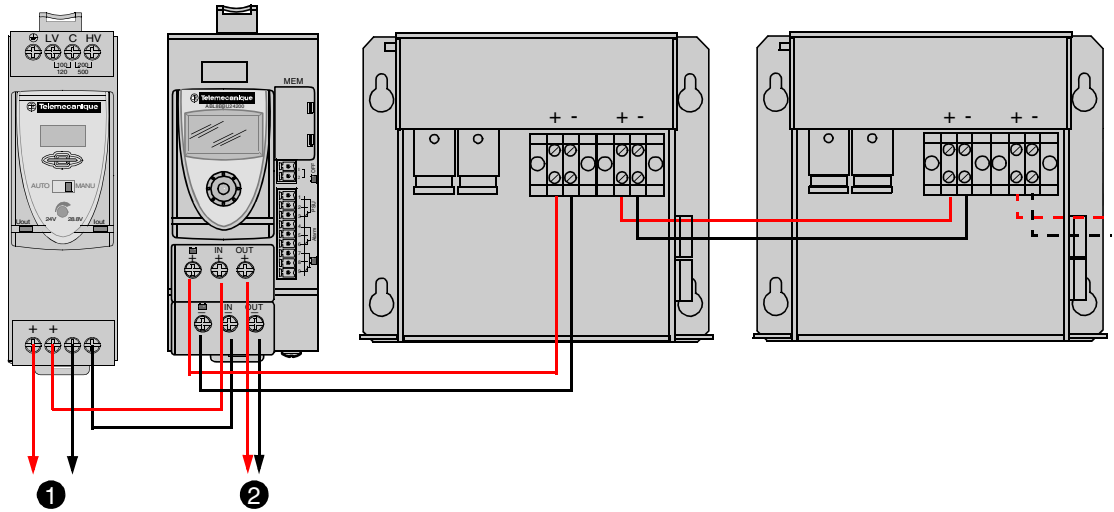
 **CAUTION****RISK OF EQUIPMENT DAMAGE**

When the maximal values of the capacitive load connected to the power supply output are not considered (non-protected output), the Battery control module can be destroyed if an overload is produced on the protected output.

**Failure to follow these instructions can result in injury or equipment damage.**

**Wiring of several Battery modules (max 3)**

In the case of parallel wiring of several Battery modules, the wiring is constructed as follows:



N°	Description
1	Non-protected output
2	Protected output for circuit requiring continuous supply in the case of primary network shut-off.



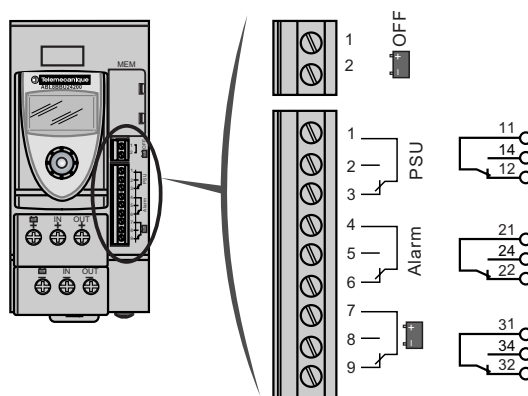
## Diagnostics contact and inhibition input wiring



### Introduction

Three diagnostics relays inform if the supply is operating, if the Battery module is operating and if there is an alarm.

The two removable screw terminal blocks accept wires of section 0.14...1 mm<sup>2</sup> (AWG 26...16) with wiring end ferrule.

### Description



N°	Connector	Relay	Contact description
1	Inhibition input (2-point terminal block)	Inhibition:  OFF	Open circuit terminals: Operating Battery module Connected terminals: Off-loaded Battery module <sup>(1)</sup>
2	Diagnostics relay (9-point terminal block)	Power Supply mode: PSU	Contact 11/14 closed: The power supply provides the current to the application
		Alarm: Alarm <b>Note</b> : The alarm can be suppressed in some cases by deactivating some tests (see <i>SERVICE menu</i> , p. 64).	Contact 21/22 closed: output overload / absence of Battery module / defective Battery module / inhibited Battery module / capacity or battery charge insufficient for the set backup time or non-measurable charge rate (in backup mode) <b>Note</b> : the 21/22 contact is also closed when it is neither in the backup mode nor in the Power Supply mode (new product state or shut-off state after a backup cycle).
		Backup mode: 	Contact 31/14 closed: the Battery modules provide the current to the application

<sup>(1)</sup>**Important:** the Battery module continues to provide a residual current essential for supplying the module electronics. In the case of prolonged absence of the power supply voltage in the IN+ and IN- terminals, it is advisable to unplug the Battery module by removing its fuses in order to avoid deep discharge.

 **CAUTION**

**RISK OF EQUIPMENT DAMAGE**

The pins 1 and 2 of the inhibition input terminal block must not be connected to any other part of a circuit, they must be free of all potential.

**Failure to follow these instructions can result in injury or equipment damage.**

Admissible current in the relay contact:

<b>Voltage</b>	<b>Current</b>
24 VDC	5 mA mini
230 VAC	500 mA maxi

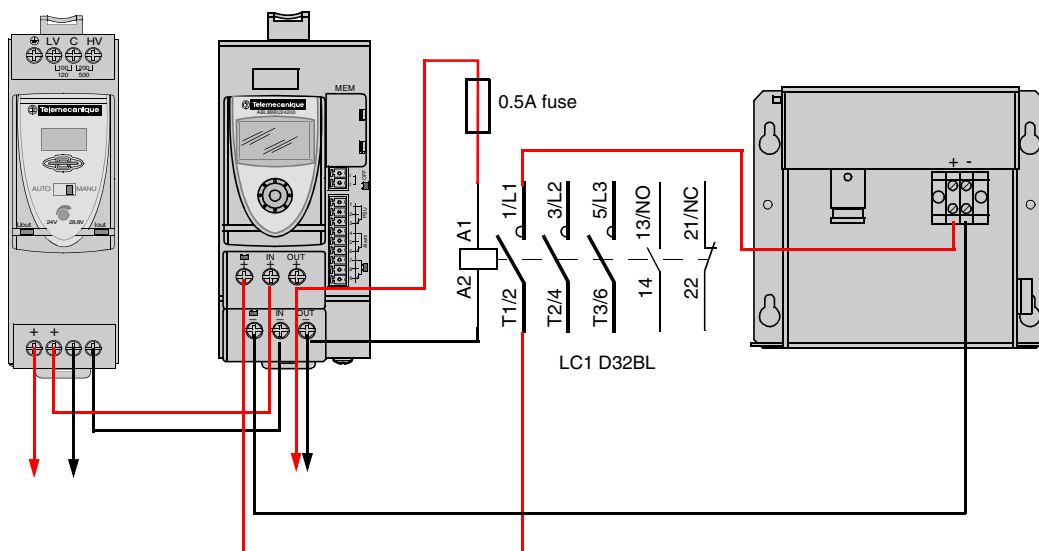
## Wiring of an auto power off circuit of the Battery Module

### Overview

The wiring present is an additional protection against the risk of deep discharge of the Battery module.

This solution consists of inserting a contactor between the Battery module(s) and the Battery control module. The contactor switches automatically in order to insulate the Battery module of the circuit.

### Contactor wiring





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# Setup



---

## Overview

### Introduction

This chapter presents the information necessary for the setup of the Battery control module as a function of the application desired.

### What's in this Chapter?

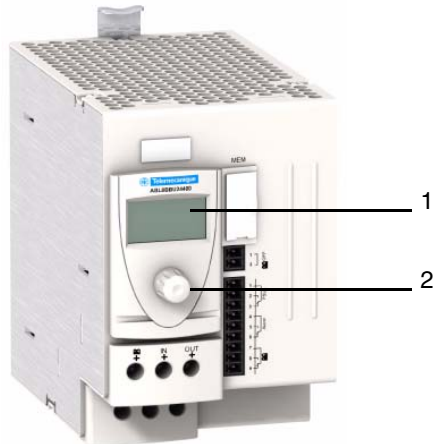
This chapter contains the following topics:

Topic	Page
User interface	38
First powering on / Minimum setup	40
The SETTINGS Menu	42
Settings transfer by memory card type SR2 MEM02	47

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## User interface

### Description



N°	Description
1	LCD display (3 background colours)
2	Browse selection button

### Function

The user interface allows:

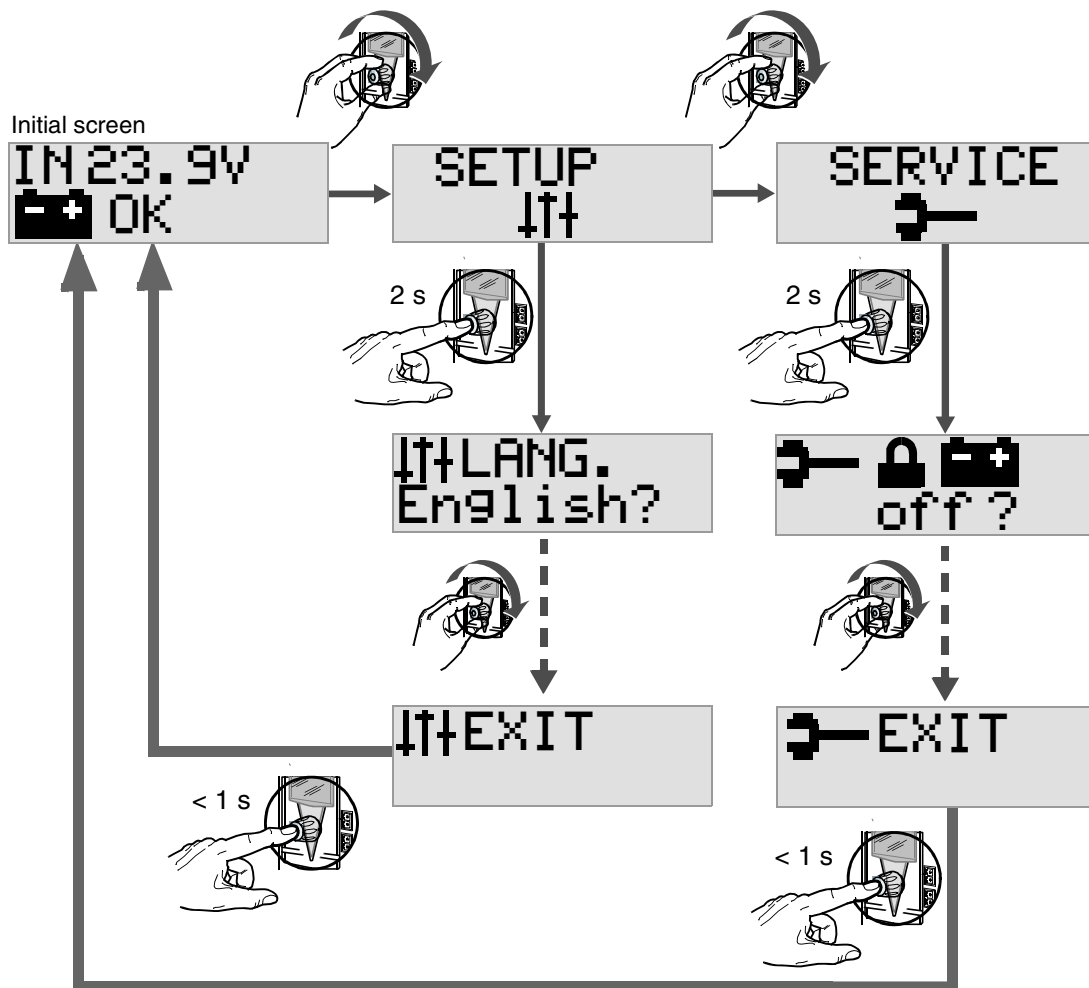
- During the operation visualize (see chapter *Diagnostic*, p. 51):
  - The system status (Power Supply mode / backup mode).
  - The status of the Battery module(s) <sup>(1)</sup>.
  - The diagnostic information in case of failure.
- During the commissioning (see *The SETUP Menu*, p. 42):
  - Setup the application.
- During the maintenance and breakdown check, (see *SERVICE menu*, p. 64):
  - To inhibit certain test functions in order to allow the downgraded operation.
  - Test the system elements.

<sup>(1)</sup> The measurement of the charge of the Battery module(s) is inactive during the first charge or during the replacement of the Battery module or if this function has been deactivated in the SERVICE menu.

**Browse rule**

Use of the browse button :

Press the button	Description
Rotation	Browse the menus / Select a setting
Short pressing (< 1 s)	Validation / Modification
Long pressing (2 s)	Go to a menu



## First powering on / Minimum setup

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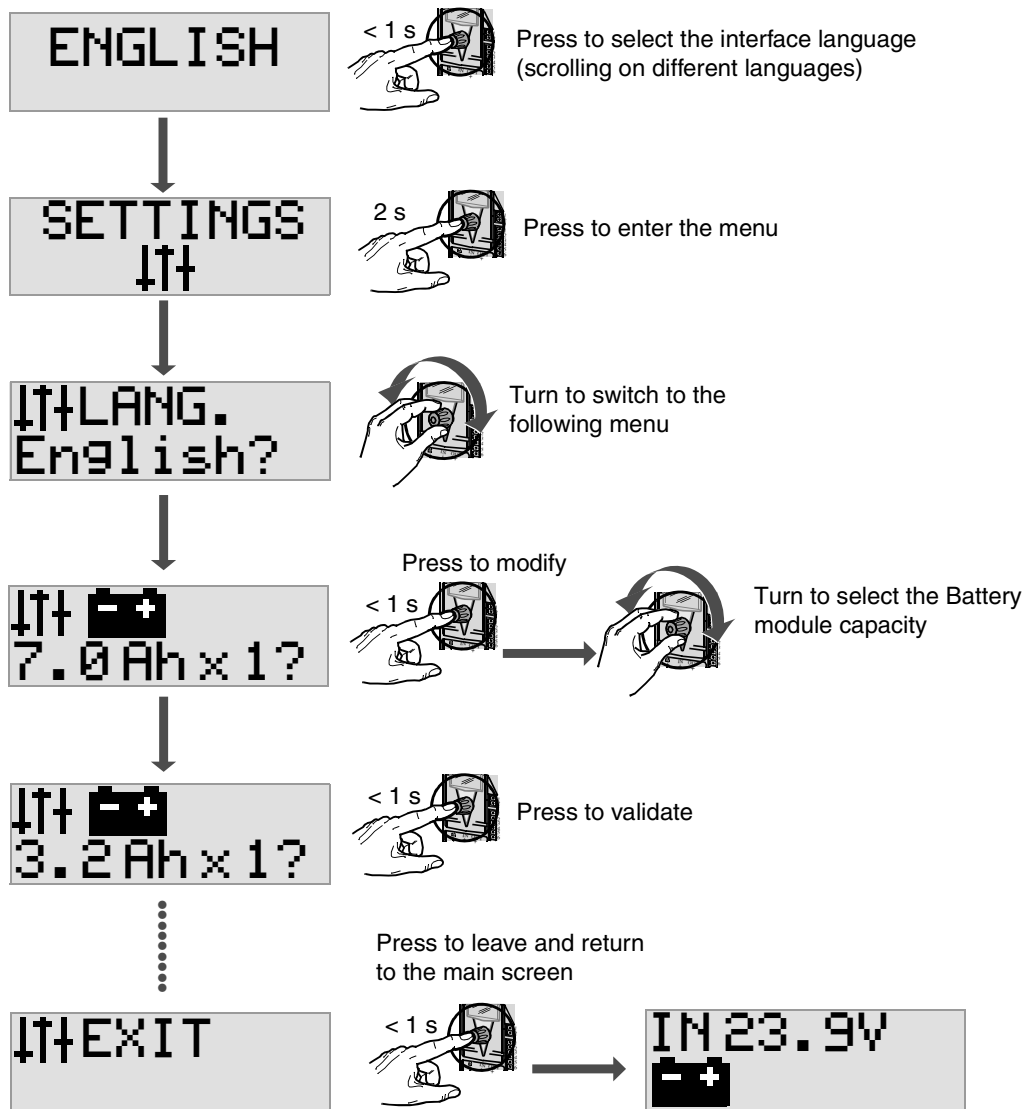
### Operation to Be Followed

The minimum setup for the system to function consists of informing the capacity of the Battery module.

**Important:** This setup allows the system to function; however, to optimize the life of the Battery module, it is strongly advisable to enter other parameters (see *The SETTINGS Menu, p. 42*).



The following scheme presents the operation to be followed during the first powering on of the Battery control module.



At the end of this first setup, the control module starts the charge of the Battery module(s). Since the charge rate is not measurable, the screen is orange until the end of the charge. After 72 H maximum of powering on of the power supply set and control module, the screen switches to green and the charge percentage of the Battery modules is displayed (see *Diagnostic*, p. 51).

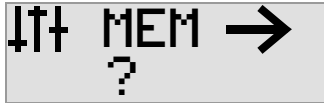




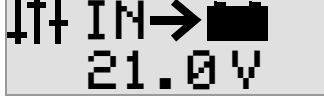

## The SETTINGS Menu


### Introduction

The SETTINGS menu defines the settings related to the choice of components and to the application.

**Note:** (\*) indicates the value by default of the setting.

### Menu tree

Screens	Description	See
	Charge a configuration from the memory card (visible only if a memory card is present)	<i>Charging of a configuration, p. 49</i>
	Back up a configuration in the memory card (visible only if a memory card is present)	<i>Backup of a configuration, p. 47</i>
	Language choice	<i>Interface language, p. 43</i>
	Battery module(s) choice	<i>Battery module type, p. 43</i>
	Backup time setup	<i>Backup time, p. 44</i>
	Setup of the Battery module activation voltage	<i>Switching threshold, p. 44</i>
	Setup of the link length between the Battery control module and the Battery module(s).	<i>Wiring length, p. 45</i>


Screens	Description	See
	Setup of the Battery module(s) temperature	<i>Battery module temperature, p. 46</i>

### Interface language

The setting **LANG.** defines the interface language:

- English
- Français
- Deutsch
- Italiano
- Espanol

### Battery module type


The setting  defines the capacity and the number of Battery module connected to the Battery control module.

Value	Reference	Description
3.2 Ah x 1	ABL 8BPK24A03 x 1	1 3.2 Ah Battery module <sup>(1)</sup>
7 Ah x 1 (*)	ABL 8BPK24A07 x 1	1x 7 Ah Battery module <sup>(1)</sup>
12 Ah x 1	ABL 8BPK24A12 x 1	1 x 12 Ah Battery module <sup>(1)</sup>
3.2 Ah x 2	ABL 8BPK24A03 x 2	2 x 3.2 Ah Battery module mounted in parallel
7 Ah x 2	ABL 8BPK24A07 x 2	2 x 7 Ah Battery module mounted in parallel
12 Ah x 2	ABL 8BPK24A12 x 2	2 x 12 Ah Battery module mounted in parallel <sup>(1)</sup>
3.2 Ah x 3	ABL 8BPK24A03 x 3	3 x 3.2 Ah Battery module mounted in parallel
7 Ah x 3	ABL 8BPK24A07 x 3	3 x 7 Ah Battery module mounted in parallel
12 Ah x 3	ABL 8BPK24A12 x 3	3 x 12 Ah Battery module mounted in parallel

<sup>(1)</sup>Combinations proposed in the selected table, see *Guidance in choosing, p. 15.*

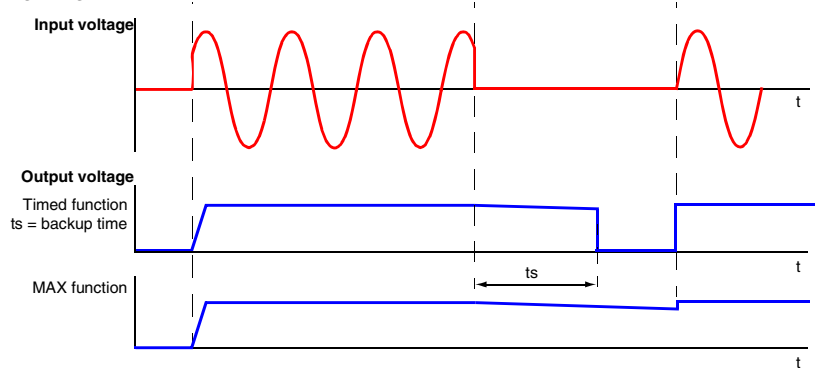
**Note:** If this parameter is badly adjusted, the charge rate and ageing test for the Battery module indications will be erroneous.

## Backup time

The setting  defines the desired backup time. Two functions are proposed:

- Timed function: back up from 10 s to 72h adjustable by 10 s steps
- Max function: backup until power supply feedback or until the discharge of the Battery module(s) (shut-off when the voltage in the Battery module terminals reach 21 V, before the deep discharge threshold).

Timing diagram of the two functions:

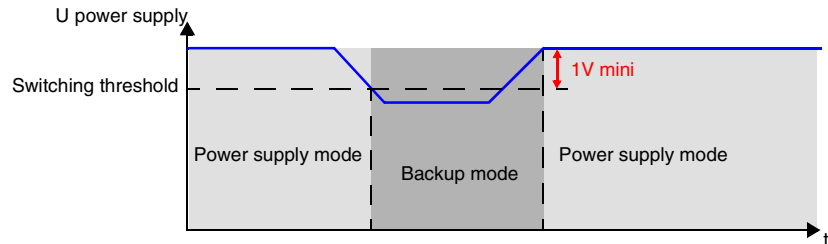


## Switching threshold


If the power supply voltage decreases below this threshold, the control module switches to the backup mode and the voltage delivered in the OUT+ and OUT- originates from the Battery module. In the current versions, this threshold is fixed at 21 V and is non-adjustable.

**Important:** To allow transition from a backup mode to the Power Supply mode, the output voltage of the power supply must be at least greater than 1 V at the switching threshold.

The following timing diagram illustrates the transition from the sbackup mode to the Power Supply mode:



**Wiring length**


The setting  defines the length of the wires between the Battery module and the Battery control module (in m or ft). This setting is used by the Battery control module to calculate the voltage at the Battery module terminals.

The table below indicates the choice of possible lengths:

Unit selected	Adjustment range	Adjustment step	Default value
m	0.1...5 m	0.1 m	2 m
ft	0.3...16.4 ft	0.1 ft	-

**Example:** the Battery module is linked to the Battery control module by two 3 m (*9.84 ft*) wires (+ and -) each. The value to enter is 3 m or *9.8 ft*.

## Battery module temperature

The setting  °C defines the temperature of the Battery module(s). This setting is used by the Battery control module in order to:

- Calculate the charge rate of the Battery module(s),
- Adapt the end of charge voltage in order to optimize the life of the Battery module(s).

The possible temperature setup modes are related to the Battery module assembly in comparison to the enclosure containing the Battery control module (see *Mounting of the Battery module, p. 22*):

Mode	Mounting
Differential	Battery module inside the enclosure (the temperatures within the proximity of the Battery modules and Battery control module develop in same proportions)
Absolute	Battery module outside the enclosure

Description of the two available usage modes:

- **Differential:**  
The control module has a built-in sensor measuring the temperature in its environment.  
The user obtains the temperature difference estimated between the control module and the Battery module such as:  
 $\Delta T = T \text{ Battery control module} - T \text{ Battery module}$ .  
**Note :** The temperatures may be measured near the modules (1 cm of housing) after the temperature has been stabilized inside the enclosure, where the modules are mounted and then reported in the menu.  
The charge voltage is adjusted automatically as a function of the temperature measured by the control module.
- **Absolute:**  
The user enters directly the Battery module temperature.  
There is no automatic charge voltage correction.

The table below indicates the possible temperature setup:

Mode	Adjutment range	Adjustment step	Default value
Differential $\Delta = XX$	0...40°C <sup>(1)</sup>	1°C	-
Absolute <sup>(*)</sup> Tbat = XX	0...50°C	1°C	25°C <sup>(*)</sup>

<sup>(1)</sup> There is no  $\Delta$  negative, the temperature of the battery Control module is always greater than that of the Battery module.

**Note:** It is recommended to use the differential mode when possible.

## Settings transfer by memory card type SR2 MEM02



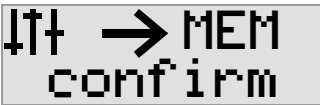
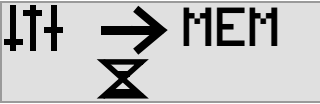
### Introduction


The Battery control module is equipped with a memory card slot allowing the :

- Execution of a backup copy of the settings,
- Transfer the settings from one control module to another (repetitive equipment, maintenance,...).

**Note:** All SETTINGS menu parameters as well as the test activation in the SERVICE menu are transferred.

### Backup of a configuration

Stage	Description
1	Remove the cover.
2	Insert the memory card in the slot (module on or off).
3	Go to the <b>SETTINGS</b> menu.
4	Turn the button to connect to the screen below and press the button (< 1 s): 
5	Press the button (< 1 s): 
6	Press the button to confirm (< 1 s):  <b>Note :</b> After confirmation, the data already in the memory card will be erased. This menu does not appear if the card is blank.
7	Loading in progress: 

Stage	Description
8	End of loading: 
9	Remove the memory card.
10	Place back the cover.

## CAUTION

### RISKS OF EQUIPMENT DAMAGE

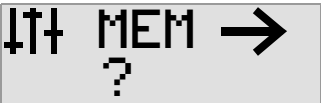


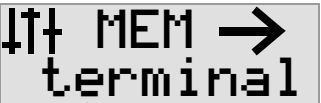
Do not put anything in the slot of the memory card next to the card and always close the access using the cover.

**Failure to follow these instructions can result in injury or equipment damage.**



## Loading of a configuration

The table below indicates the stages to be followed:

Stage	Description
1	Remove the cover.
2	Insert the memory card in the slot (module on or off).
3	Go to the <b>SETTINGS</b> menu.
4	Press the button (< 1 s): 
5	Press the button (< 1 s): 
6	Loading in progress: 
7	End of loading: 
8	Remove the memory card.
9	Place back the cover.

## CAUTION

### RISKS OF EQUIPMENT DAMAGE

Do not put anything in the slot of the memory card next to the card and always close the access using the cover.

**Failure to follow these instructions can result in injury or equipment damage.**



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# Diagnostic



---

## Overview

### Introduction

This chapter presents the elements necessary for the analysis of diagnostic information and fault as well as solutions to bring it about.

### What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Diagnostic	52
Faults - causes - remedies	55

## Diagnostic

### Overview

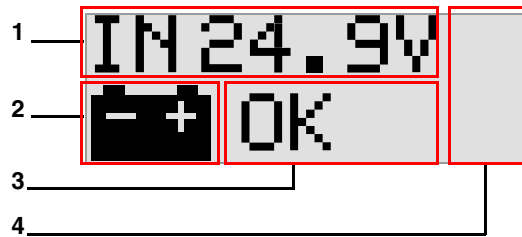
The diagnostic information facilitates an easy commissioning and a rapid error diagnostic.

The diagnostic information of the Battery control module is provided to the users in 3 forms:

- LCD background screen colour:
  - Green OK
  - Orange: Warning
  - Red: Alarm
- Diagnostic pictorial sign displayed on the screen
- Diagnostics relay

### Description of the displayed zones











The scheme below presents the different displayed zones:



N°	Description	
	Power Supply mode	Backup mode
1	Input voltage = value of the supply output voltage	
2	The state and charge level of the Battery module	
3	Charge rate if measurable or alarms (battery inhibited or disconnected)	<ul style="list-style-type: none"> <li>• Timed function: remaining backup time.</li> <li>• Max function: backup time elapsed since the last transition in backup mode.</li> </ul> Format : hour:minute or s
4	Alarm on the output : overload	

**Visualisation and relay state** The scheme below regroups the diagnostics information according to the state of the Battery control module :

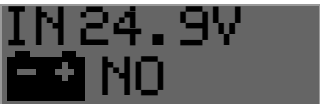



Screen color	Display	State of diagnostics relay			Signification
		PSU	Alarm	Bat	
Green					The Power Supply mode and battery charged at 100%.
Green					Power Supply mode, charging battery, battery charge sufficient for the chosen backup time.
Orange					Power Supply mode, first battery charging and non-measurable charge rate.
Orange					Power Supply mode, battery charged at 100% and battery life < 50%.
Orange					Power Supply mode, charging battery, battery charge insufficient for the chosen backup time.
Red					Power Supply mode and disconnected battery.
Red					The Power Supply mode and inhibited battery.
Red					The Power Supply mode and battery to be replaced.


Screen color	Display	State of diagnostics relay			Signification
		PSU	Alarm	Bat	
Red		-		-	Overload on the output.
Orange					Backup mode, 16h21min remain in comparison to the backup time set or 16h21min have passed since the transition to the backup mode, sufficient battery charge.
Red					Backup mode, 43 s remain in comparison to the backup time set or 43 s have passed since the transition to the backup mode, sufficient battery charge for backup time set.

## Faults - causes - remedies

**Introduction** A fault is signaled on the Battery control module by the red background colour of the LCD screen and by a pictorial sign linked to each fault type.

### Fault resolution

Fault screen	Signification	Causes	Remedies
	Unavailable Battery module	Blown fuse or fuse not plugged into the attachment	Plug in the fuse or replace it if blown (after elimination of the failure source)
		Unplugged wire	Check connection
		Cut wire	Check wires continuity
		Internal cut-off in the Battery module	Replace Battery module
		No connected Battery module	Connect Battery module
	Deactivated Battery module	Activated inhibition input	Check the connection of the inhibition input
		Activation function of the battery turned on OFF (SERVICE menu)	Check the setting value
	Replace Battery module	Battery capacity is less than 80% of its rated capacity, which corresponds to 50% of the autonomy.	Replace the Battery module
	Overload	Too many elements (charges) connected on the Battery control module	Check that the sum of the rated currents of the elements do not surpass the rated current of the Battery control module.
		Short-circuit on the output	Eliminate the source of the short-circuit

Fault screen	Signification	Causes	Remedies
	Charge rate or capacity of the Battery module insufficient to allow the setup of the backup time for the required consumption	Capacity of the Battery module is too weak in comparison to the requirement	Check the choice of the Battery module, possibly choose a greater capacity module or use parallel modules.
		Too frequent network cut-offs, the Battery module has no time to recharge	Use the Battery modules of greater capacity with parallelization if necessary
		Loss of Battery module capacity	Replace the Battery module



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# Operation timing diagrams



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## Overview

### Introduction

You will find in this chapter the timing diagrams illustrating the operation of the Phaseo power outage solution according to the setup of the operating mode and different encountered figure cases.

### What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Timed function	58
All functions (time-delayed or max): voltage feedback before module shut-off	59
Max function with long power outage (complete discharge of the Battery module)	60
Output behaviour in the case of overload or short-circuit	61

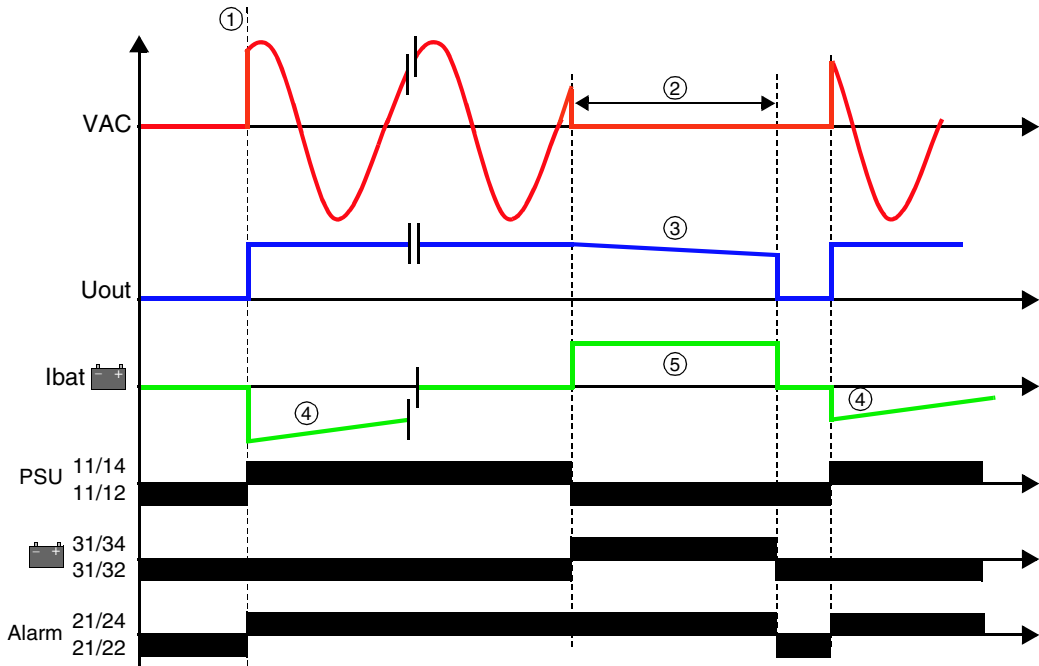
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## Timed function

### Timing Diagram

The following aspects are taken into account in the following example :

- the network cut-off time > backup time,
- during powering on, when the Battery module is not completely charged (for example in reference to a previous backup cycle).



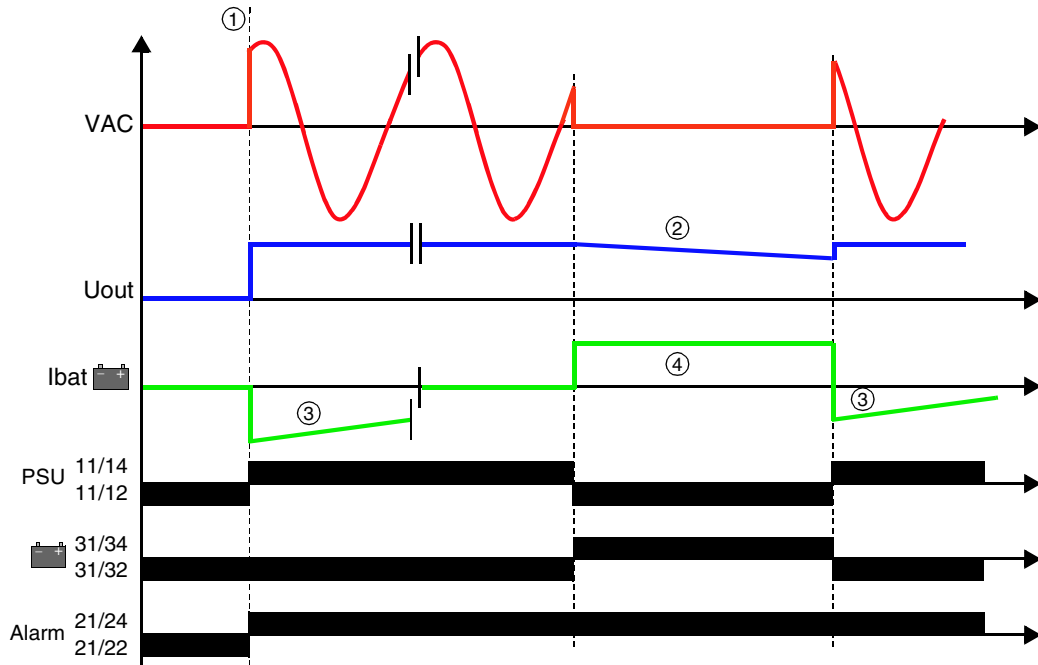
N°	Description
1	During powering on, the control module recharges the Battery module
2	Backup time parameterized
3	Backup mode: voltage provided by the Battery module There is no additional voltage regulation: $U_{out} = 21...26$ VDC
4	Charging phase of Battery module
5	Discharging phase of Battery module

## All functions (timed or max): voltage feedback before module shut-off

### Timing Diagram

The following aspects are taken into account in the following example:

- During powering on, when the Battery module is not completely charged (for example in reference to a previous backup cycle).



N°	Description
1	During the powering on, the control module recharges the Battery module
2	Voltage provided by the Battery module There is no additional voltage regulation: $U_{out} = 21...26$ VDC
3	Charging phase of Battery module (such as the charge rate is $< 80\%$ the alarm relay is not switched).
4	Discharging phase of the Battery module

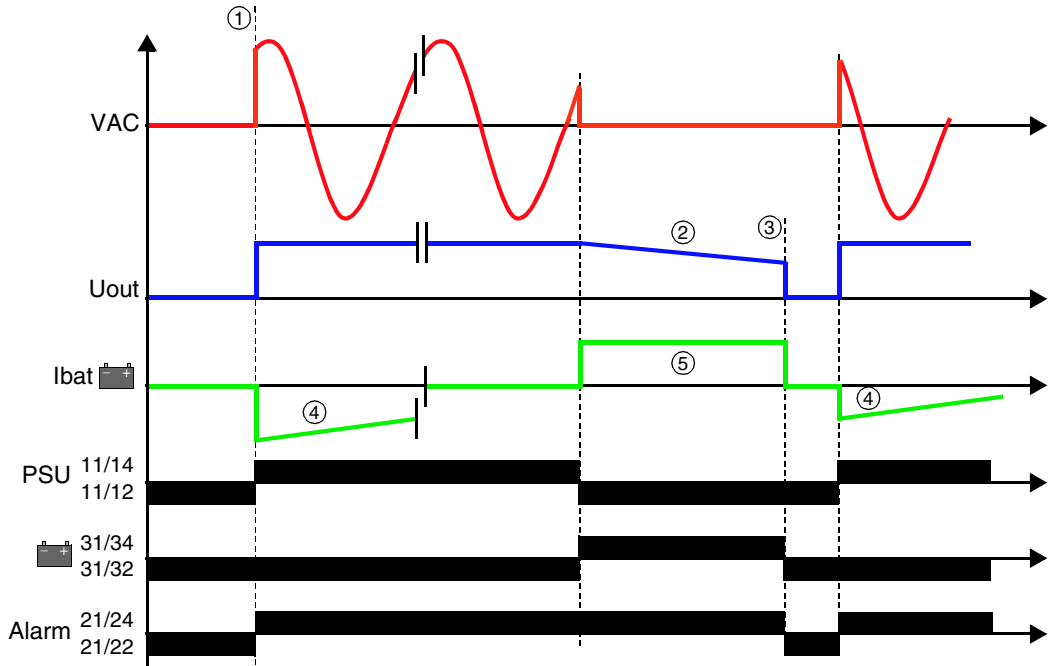
## Max function with long power outage (complete discharge of the Battery module)

### Timing Diagram

The following aspects are taken into account in the following example :

- the network cut-off time > possible backup time,
- during powering on, when the Battery module is not completely charged (for example in reference to a previous backup cycle).

**Note:** This figure case is to be avoided, if a new close power outage appears, it will not be possible to provide the current such as the Battery module will not be charged again.



N°	Description
1	During powering on, the control module recharges the Battery module
2	Voltage provided by the Battery module There is no additional voltage regulation: $U_{out} = 21 \dots 26 \text{ VDC}$
3	The voltage at the Battery module terminals has reached 21 V, the current is turned off in order to avoid the deep discharge of the batteries. The 'Alarm' relay falls indicating the low charging level.
4	Battery module charging phase (such as the charge rate is < 80% the alarm relay is not switched).
5	Discharging phase of the Battery module

## Output behaviour in the case of overload or short-circuit

---

### Overview

It is possible to execute backup solutions with power supplies, of which the rated current is less than that of the Battery control modules.

The output behaviour of the Battery control module, thus, depends on the power supply association/module, it may be different according to the operating modes (power supply or backup).

The protection against the overcurrents and short-circuits is according to the ensured case either by the power supply or by the control module.

As a consequence, the junction section in the control module output must take into account the rated current of this module (20 A or 40 A) and not only the rated power supply current.

---

**Output behavior** The output behavior is detailed in the following table :

Product associations	ABL 8 power supply	RPS24030	RPS24050	RPS24100	RPS24200	WPS24200	WPS24400
	Control module	ABL 8BBU24200					ABL 8BBU 24400
Rated current on the control module output	Power Supply mode	3 A	5 A	10 A	20 A	20 A	40 A
	Backup mode	20 A	20 A	20 A	20 A	20 A	40 A
Admissible current on the control module output	Power Supply mode	4.5 A/4 s <sup>(1)</sup>	4.5 A/4 s <sup>(1)</sup>	4.5 A/4 s <sup>(1)</sup>	30 A/10 s	30 A/10 s	60 A/10 s
	Backup mode	26 A/10 s <sup>(2)</sup>	26 A/10 s <sup>(2)</sup>	26 A/10 s <sup>(2)</sup>	26 A/10 s <sup>(2)</sup>	60 A/10 s <sup>(2)</sup>	90 A/10 s <sup>(2)</sup>
Behavior in the case of overload or short-circuit	Power Supply mode	Power supply protection trips <sup>(3)</sup>			Temporary overload: protection trips of the control module <sup>(4)</sup> Permanent overload or short-circuit: power supply protection trips <sup>(3)</sup> and of the control module <sup>(4)</sup>		
	Backup mode	protection trips of the control module <sup>(4)</sup> , then off-loading of the module.					
Reset after protection trips	Power Supply mode	Temporary voltage interruption at the power supply primary for about 5 s.					
	Backup mode	Power supply powering on (impossible to rearm without the supply output voltage).					

(1) 4.5 A/4 s then transition to the backup mode

(2) maximum time with new Battery module and charged at 100%

(3) LED Uout red and contact 11/14 non-closed

(4) Display 'l>>' in the front face of the module and alarm contact 21/22 closed

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# Maintenance



# 9

---

## Overview

### Introduction

You will find in this chapter the necessary elements for the maintenance of the backup solution.

### What's in this Chapter?

This chapter contains the following topics:

Topic	Page
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Battery modules replacement	66

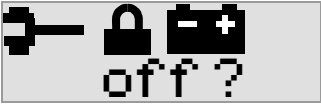





## SERVICE menu

### Introduction




The SERVICE menu allows the solving of particular problem such as:

- machine transport (off-loading of the Battery module),
- machine tests (diagnostics inhibition),
- test the Battery module and the LCD screen,
- factory configuration reset (setup by default),
- on-board software update (only in factory or qualified technical center).

### Menu description

Screens	Function	Description
	Battery module inhibition, Battery module is turned off (including recharge)	on->off : Deactivated Battery module (the alarm is active, 21/22 contact closed) off->on : Activated Battery module
	Battery module ageing test	See description below.
	LCD screen test	Horizontal and vertical scanning of each pixel in the LCD screen
	Activation/deactivation of the battery charge rate display	Allows the deactivation of the alarm contact and suppression of the charge rate display.
	Activation/deactivation of the battery ageing display	Allows the deactivation of the alarm contact and suppression of the fault screen display.
	Replace the Battery module(s)	Allows the reinitialisation of the ageing calculation in the Battery module(s). To carry out during the replacement of the Battery module(s). After the setting reinitialisation of the former Battery module, a test of the new module is automatically carried out.





Screens	Function	Description
	Reinitialisation	Allows the setting to be feedback to their default value (factory configuration). The default settings will be taken into account at the next powering on.
	Onboard software update	Only in factory or qualified technical center.
	Number of On-board software version and checksum of the charged parameters.	Display the On-board software version. The checksum allows the very rapid inspection that all configuration parameters are correct or to carry out configuration comparisons among several modules.

### Battery module test

The Battery module test allows the inspection of the battery module ageing (not to be confused with the charge level).

**Note:** This test is also carried out automatically twice per month.

When this test is issued (the total test duration: approximately 48H from a charged battery pack and under the condition that the module does not pass to the backup mode during the test):

- if the Battery module has not lost its capacity, no message is shown,
- if the capacity of the Battery module has started to decrease (the mode is around 50% of its life), the screen background turns orange in the Power Supply mode,
- if the capacity of the module is less than 80%, which corresponds to around 50% of autonomy, the default screen  is displayed and the 21/22 alarm contact is switched on. The module(s) must be replaced as quickly as possible. While waiting the Battery module(s) replacement, the alarm can be inhibited using the Enabling/disabling menu .

## Battery modules replacement

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### Replacement

A Battery module is considered to reach its end of life when it has lost 50% of its rated capacity.

The batteries contained in the Battery modules are irreplaceable. When the batteries have reached their end of life, it is necessary to change the Battery module in its set.

When several Battery modules are parallel connected, these must be replaced at the same time.

After the exchange of the Battery modules, it is suitable to reinitialize the ageing test (see *SERVICE menu*, p. 64).

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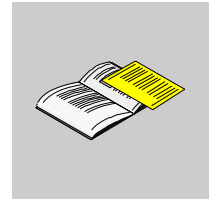
### Maintenance

The Battery modules contain lead sealed batteries. This battery type does not require maintenance.

 <b>WARNING</b>
<b>RISKS OF INJURY</b> The batteries contained in the Battery modules have no maintenance and must, under no circumstances, be open. <b>Failure to follow these instructions can result in death, serious injury, or equipment damage.</b>

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# Appendices



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## Overview

### Introduction

The following appendices contain general information on the operation and characteristics of the 2 Battery control modules and the 3 Battery modules.

### What's in this Appendix?

The appendix contains the following chapters:

Chapter	Chapter Name	Page
A	Characteristics	69
B	Battery general information	75
C	FAQ	77



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# Characteristics



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## Overview

### Introduction

You will find in this chapter the electrical, operating and environmental characteristics of the Battery control modules and Battery modules.

### What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Electrical Characteristics of the Battery Control modules	70
Operating and environmental characteristics of Battery control modules	71
Electrical characteristics of the Battery modules	72
Operating and environmental characteristics of Battery modules	73

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## Electrical Characteristics of the Battery Control Modules

### Certifications and standards

The table below describes the certifications and standards applicable to the Battery control modules:

Reference		ABL 8BBU24200	ABL 8BBU24400
Certifications		CB scheme EN60950-1, UL, cCSAus, GL	
Conformity with standards	Security	EN60950-1, EN61204	
	CEM	EN61000-6-2, EN61000-6-3	

### Electrical Characteristics

The table below describes the electrical characteristics of the Battery control module input:


Reference		ABL 8BBU24200	ABL 8BBU24400
Rated voltages		24...28.8 VDC	
Admissible voltages		22...30 VDC	
Power dissipated at the rated charge		< 7 W	< 12 W
No load consumption / on load /maxi		0.1/1.7/21.7 A	0.1/1.7/41.7 A
Activation threshold		Fixed 21 VDC	

The table below describes the electrical characteristics of the Battery control module output:

Reference		ABL 8BBU24200	ABL 8BBU24400
Uout rated voltage		rated mode: Uin -0.25 V battery mode: Ubatt -0.5 V	
Maximum rate current		20 A	40 A
Residual ripple - noise		< 200 mV	
Holding time	I = 0.5 A	As a function of the battery used, > 20 hours	
	I = 40 A	As a function of the battery used, < 15 minutes	
Protection against short-circuits	Power Supply mode	Protection of the power supply.	
	Backup mode	Permanent, automatic restart	
Overload protection		1.5 In	

## Operating and environmental characteristics of Battery control modules

**Characteristics** The table below describes the operating and environmental characteristics of the Battery control module:

Battery control module reference		ABL 8BBU24200	ABL 8BBU24400
Screw terminal block capacity	Input	2 x 0.5...10 mm <sup>2</sup> (20...8 AWG)	
	Output	2 x 0.5...10 mm <sup>2</sup> (20...8 AWG)	
	Diagnostics relay	0.14...2.5 mm <sup>2</sup> (25...14 AWG)	
Degree of protection		IP20	
Storage temperature		- 40...+ 85 °C (- 40...+ 185 °F)	
Operating temperature		- 25...+ 60 °C (- 13...+ 140 °F)	
Max. relative humidity		90 % in operations, 95 % in storage	
Vibrations, according to EN 61131-2		3...11.9 Hz amplitude 3.5 mm (0.138 in) and 11.9...150 Hz acceleration 2 g	
Installation attachment		Rail  , 35 x 7.5 mm (1.38 x 0.29 in) and 35 x 15 mm (1.38 x 0.59 in)	
Operating position		Vertical Horizontal (with downgrading of the maximum power by 20% from 50 °C (122 °F))	
Protection class		Class II	
Charging time		As a function of the battery used	
Diagnostic	LCD screen	Green: rated state, Orange : warning, Red: default	
	By relay	3 OF relays for power supply state, battery state and alarm	
Relay characteristic		230 VAC, 0.5 A max 24 VDC, 5 mA max	
Dielectric strength of 50 Hz for 1 mn in input/ground		500 VAC eff	
Dielectric strength of 50 Hz for 1 mn in output/ground		500 VAC eff	
<b>Emission</b>			
Led/emitted		EN 55022 Class B	
<b>Immunity</b>			
Electrostatic discharges		EN 61000-4-2 (6 kV contact/8 kV air)	
Emitted electromagnetic fields		EN 61000-4-3 level 3 (10 V/m)	
Inducted electromagnetic fields		EN 61000-4-6 level 3 (10 V/m)	
Rapid transitions		EN 61000-4-4 level 3 (2 kV)	
Shock waves		EN 61000-4-5 level 2 (1 kV)	

## Electrical characteristics of the Battery modules

### Introduction

This part details the electrical characteristics of the Phaseo Universal Battery module input and output.

### Technical characteristics, certifications and standards

The table below describes the Battery module type and certifications and standards applicable to the Battery module:

Battery module reference		ABL 8BPK24A03	ABL 8BPK24A07	ABL 8BPK24A12
Battery type		Lead sealed battery		
Certifications		UR, CE		
Conformity with standards	Security	Conformity in course, consult the <a href="http://www.telemecanique.com">www.telemecanique.com</a> site		
	CEM			

### Electrical characteristics of the Battery modules

The table below describes the electrical characteristics of the Battery modules:

Battery module reference		ABL 8BPK24A03	ABL 8BPK24A07	ABL 8BPK24A12
Rated charge voltage		24...28.8 VDC		
Admissible charge voltage		22...29 VDC		
Charge current		0.5 A	0.7 A	1.2 A
Un rated voltage		24 VDC		
Maximum rate current		32 A	40 A	75 A
Rated capacity		3.2 Ah	7 Ah	12 Ah
Immunity to cut-offs	Holding time at 20°C maximum	20 h at 0.16 A	20 h at 0.35 A	20 h at 6 A
	Holding time at 20°C minimum	5 min at 8.4 A	5 min at 18.2 A	5 min at 31.3 A
Protection against short-circuits and overloads		1 x 20 A auto fuse	1 x 30 A auto fuse	2 x 30 A auto fuse
Self-discharge rates		1 month : 3 %, 3 months : 9 %, 6 months : 15%		




## Operating and environmental characteristics of Battery modules

### Introduction

This part details the operating and environmental characteristics of the Phaseo Universal Battery modules.

### Characteristics

The table below describes the operational and environmental characteristics of the Battery modules:

Battery module reference	ABL 8BPK24A03	ABL 8BPK24A07	ABL 8BPK24A12
Input screw terminal capacity	2 x 0.5...10 mm <sup>2</sup> (20...6 AWG)		4 x 0.5...10 mm <sup>2</sup> (20...6 AWG)
Output screw terminal capacity	2 x 0.5...10 mm <sup>2</sup> (20...6 AWG)		4 x 0.5...10 mm <sup>2</sup> (20...6 AWG)
Degree of protection	IP10		
Storage temperature	- 20...+ 50 °C (-4...+122 °F)		
Operating temperature	0...+ 40 °C (32...+104 °F)		
Vibrations, according to EN 61131-2	3...11.9 Hz amplitude 3.5 mm (0.138 in) and 11.9...150 Hz acceleration 2 g		
Installation attachment	Rail  , 35 x 7.5 mm (1.38 x 0.29 in) and 35 x 15 mm (1.38 x 0.59 in) <sup>(1)</sup> or by 4 screws Ø 5 mm (0.197 in)	By 4 screws Ø 5 mm (0.197 in)	
Operating position	Vertical or horizontal		
Serial wiring	No		
Parallel wiring	Yes		
Protection class	Class III		
Life (approximate)	44,000 H at 20°C,		
	31,000 h at 25°C,		
	22,000 h at 30°C,		
	15,000 h at 35°C,		
	11,000 h at 40°C,		
	7,300 h at 45°C,		
	5,000 h at 50°C,		

<sup>1</sup> With ABL 1A02 mounting kit



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## Battery general information

**B**

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### Battery Generalities

#### The Capacity and Battery Charge Rate

Capacity:

- Current provided by a battery for a determined time and completely being charged.
- The capacity provided in the catalog is the new value, expressed in Ah.
- Example: In theory, a 12Ah battery will be capable of providing a 0.6A current for 20H.
- The capacity diminishes with the battery age.

Charge rate:

- Proportion of the capacity available at time t.
- Expressed in % of the total capacity.
- The charge rate diminishes when the battery provides energy.

Capacity = 1l  
Charge = 0%



Capacity = 1l  
Charge = 95%



**Lead Battery Generalities**

Charge:

- The performances and battery life depend on the charge efficiency.
- The end of charge voltage is particularly important, it must be adapted according to the ambient temperature.

Discharge:

- The time during which the battery will be able to provide energy depends on its capacity expressed in Ah.
- The capacity also depends on the temperature.
- The voltage at the battery terminals must never be less than a value termed the deep discharge voltage.
- Even when not being used, the battery is discharged at about 3% per month at 20°C.

Life:

- About 5 years at 20°C.
  - About 15 months at 40°C.
  - A battery is considered to reach its end of life when it has lost 20% of its capacity, which corresponds to a loss of 50% of the autonomy time for rapid discharges.
- 

**The battery capacity as a function of the temperature**

The table selecting the Battery modules as a function of current and backup time has been performed for a temperature of 20°C.

The following table indicates the coefficient to be applied at the backup time for different temperatures:

T (°C)	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50
Coef.	0.65	0.67	0.73	0.78	0.84	0.89	0.94	0.97	1	1.02	1.05	1.07	1.09	1.10	1.11

**Example:** A Battery module ABL 8BPK24A03 will be able to deliver 2 A for :

- 1 H at 20°C,
  - 1 H x 0.65, that is 39 min at -20°C,
  - 1 H x 1.11, that is 67 min at 50°C,
-

---

## FAQ



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### FAQ

**Other batteries ?** Schneider Electric assumes no responsibility of possible consequences in the case of using other references on power supply and/or of batteries (different internal resistances of all manufacturers, thus optimization of charge settings to be executed for each battery model).

**Update ?** The on-board software update by our clients is not predicted to this day (possible in factory or by product department support services).

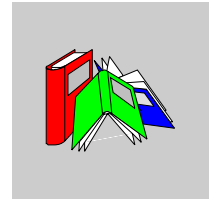
**Battery temperature ?** There is no temperature sensor in the battery.

**Temperatures < 0°C ?** In the catalog, the operating temperature range indicated is from 0°C to +40°C for less than 0°C, the liquid crystal display is no longer fonctionnal. The set operation is, however, protected up to -20°C (with a shorter backup time, see evolution of the battery capacity as a function of the temperature).



---

# Glossary



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<b>Backup mode</b>	Operating mode of the Battery control module during which the 24 VDC voltage provided to the application originates from the Battery module.
<b>Deep discharge threshold</b>	Threshold of the Battery module voltage below which a significant and irreversible degradation is produced by plates sulphatization.
<b>Holding time</b>	Time that the backup mode must last.
<b>Power supply mode</b>	Operating mode of the Battery control module during which the 24 VDC voltage provided to the application originates from the power supply mode.
<b>PSU</b>	In English 'Power Supply Unit' indicates the (ABL 8RP/WP) power supply.
<b>Self-discharge</b>	Even when not being used, the battery is discharged at about 3% per month at 20°C.
<b>Switching threshold</b>	Threshold of the power supply voltage below which the Battery control module must switch to the backup mode.

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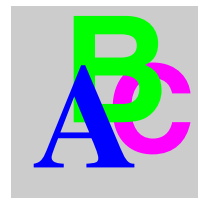




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