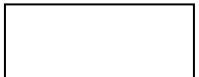


PANELS RESETTABLE FUSES	NL102-00X
Function of the device	12 or 24Vdc electric switchboard with automatic resettable fuses
Manufacturing	certified ISO 9001 - NAVYLEC® a brand of ANNECY ELECTRONIQUE – FRANCE
Number of circuits	from 2 to 6
Number of poles	single pole
Fuses rating	standard mounted 2,5A/5A/10A depending on panel
Fuses types	Polyswitch PPTC types welding on the printed circuit
Fuses capability	Umax : 30Vdc / Imax : 40A
Power supply	12 or 24Vdc
Green LED	Power On
Red LED	Lighting : open circuit / short-circuit or overload
Electric connection input	faston 6.3mm terminals positives according the panel and one negative
Electric connexion output	faston 6.3mm terminals according the panel
Fixing	4 provided screws stainless black
Front panel material	aluminium thickness 1.5mm
Color	black epoxy painting, white and yellow serigraphy
Protection	circuit varnish protected
Operating T°	-20° to +70°C
Storage T°	-30° to +85°C
Homologations	Printed circuit NF C 93-173
European directives	2004/104/CE, 2002/96/CE (2003), 2002/95/CE (2003) RoHS
Warranty	2 years



PANELS	FRONT PANEL SIZE HxL mm	STANDARD FUSE RATING	CUT OUT SIZE LxHxD mm
NL102-002	60 x 140	5A + 10A	92x45x38
NL102-003	80 x 140	2,5A + 5A + 10A	92x65x38
NL102-004	100 x 140	2,5A + 2x5A + 10A	92x85x38
NL102-005	120 x 140	2x2,5A + 2x5A + 10A	92x105x38
NL102-006	140 x 140	3x5A + 3x10A	92x125x38



ENGLISH

Utilisation et description

The range of on-board electric panels NL102 with automatic resettable fuses allows ensuring an easy distribution, sure and flexible according to the number of output to be protected for the main service circuit 12 or 24Vdc. The use of automatic resettable fuses is spread and avoids having to replace a fuse.

Security measures

- Installation instructions must be followed carefully to place the NL102.
- The NL102 must be used in accordance with its specifications.
- Any intervention on the on-board electric circuit must be done according to the current legislation.
- The electric wire cross-section must adapt themselves to the amperage of the circuit and their length must be as short as possible. All connections must be done correctly.
- It is not possible in the range of this manual to train the installer with all the knowledge on the electric systems which can be necessary to install this product correctly. In case of doubt we recommend you to call a professional.
- The panels should not be installed in an explosive environment such as an engine room or as a battery compartment because the switches employed are not explosion-proof.

Installation

The panel NL102 can be used only on one electric circuit of 12 or 24Vdc. Check attached diagram for correct connection. This diagram shows standard installation of the panel; it cannot be used as detailed wiring guide for a specific electric installation.

- Concerning cutting to be realized and the screw installation (4 screws provided stainless black treatment) please consult the panel diagram on scale 1 joined.
- The main positive connection must be disconnected from the terminal of the battery having to feed the panel to avoid any risk of short-circuit lasting the installation of this panel.
- Connection of the positive outputs, 1 to 6 according to the panel:
Check the fuses rates and their adequacy with the consumers connected on each circuit. These circuits being given in amps, please consult the last page for the distribution of the fuses values 2.5A/5A/10A. To determine the good positive wire cross-section (red color preferably) according to the amps of the consumer, use the "Wire Length" table of this manual to help you. Use then Faston female terminals isolated from 6,3mm (color according to the wire cross-section: Red/1,5mm²; Blue/2,5mm²; Yellow/6mm²), crimp them on wire and plug in the termination of these wires on the respective strips 6,3mm of the outputs. At this level we advise you to locate these wires by sticking labels according their output number 1 to 6 and also for several panels T1, T2, T3, etc
- Consumers negative connection:
These tables do not ensure the distribution of the negative. Use the same wire cross-sections that for the positive and connect them on a common mass bar existing or to install in general near the boat's electric switchboard.
- Panel power supply lighting connection:

Each panel has a negative input (printed mark "- IN") to allow the green LEDs of state lighting. Use a 1mm² cross wire (black color preferably), crimp a 6,3 mm female Faston isolated (as above) then plug in the termination of this wire on the strip "- IN". The other end of negative wire must be connected to the common mass bar. In the event of use of several panels, it is possible to inter-connect them "- IN" and to connect only one negative on the common bar of negative. For the positive connection (panels NL102-004 to NL102-006 have several input "+ IN" in parallel which can thus be added to use more current, See Fig. B) it is necessary to make the amps addition of the consumers being able to be used in the same time. This calculation appears more realistic than to make the addition of all the fuses amps at the output protection and will make it possible to have a wire cross-section /optimal current. According to the amp to be brought to the electric control panel you will determine a wire cross-section of power supply adapted between the battery (positive terminal) and this panel using the "Wire Length" table of this manual. The same wire cross-section between the negative terminal of the battery and the common mass/distribution bar need to be used. The Faston 6,3mm terminals can receive at maximum isolated yellow female Faston 6,3mm for 6mm² wire cross-section. That explains the presence of 2 or 3 input positives on the back-side panel if the amps to be brought by the panel cannot be supported by only one wire of 6mm². In this case a battery wire of the maximum cross-section need to be connected in a positive bar distribution near the panel, it is easy then to send towards the panels several positive wires of 6mm².

Installation (rest)

It is strongly misadvised using these Faston plug as derivation with the risk to cause an overload on the electric wire. In the event of use of several panels it is necessary to take their power supply directly on the positive and negative external bars.

Wire choice, example: a 6 circuits panel NL102-006 which must provide 35 Amp - distance battery/table: 5 meters => choose according to the Wire Length table (2x5 meters = 10m), a positive wire of 20mm² (idem for the negative one) to the common positive bar near the NL102-006, use 3 wires of 6mm² to the panel and a gross cross-section of 18mm² will be obtained.

Any departure from the battery (at source) must be protected by a main fuse (on the positive one, according to the amps/consumption charges) and to have a system switch (ISO10133). For the panels electric wire protection, battery side, the selected fuse will be given by the addition of all the values present on the panels.

Stickers

Each panel is delivered with a 36 labels standard sheet (text FR, EN and pictos). Optional sheets of 132 labels are proposed. They make it possible to customize your NAVYLEC electric switchboard. The labels need to be stick in the white rectangles. The labels material is made of vinyl high performance which guarantees strength to moisture and a long lifespan.



Use

When the panel power supply is connected:

Check that the switches are in position 0 (Stop)

Switch On the main battery switch

Push all the switches in position 1 (On), check that the green LED of each circuit indicates the power on and the correct operation of the connected consumers.

The fuses ensure, according to their rates, the protection of the connected devices. In overconsumption or short-circuit case, they are cut.

Their values (2.5/5/10A) are predetermined during the factory assembly (they are welded onto the printed circuit, mounting: see the last page of this manual).

Note: In the event of overload and fuse automatically off the green LED dies out because the circuit is not any more under voltage but the red LED is lighting and indicates a fault. Rearmament is carried out automatically if the short-circuit or the overload disappears.

Uses the good fuse rate (same or higher size) for your connected electric consumers (refer to the technical documentation of your equipments or the technical labels stuck on those), respect a maximum rate of 10A per circuit.

Warranty conditions

It has a 2-year warranty. The purchase invoice attests authenticity.

NAVYLEC ANNECY ELECTRONIQUE, ISO9001 certified company, devotes special attention to manufacturing quality and certifies that the panels NL102 have been manufactured in accordance with the current standards and legal provisions. All electric switchboards have been checked and tested during manufacturing. Not following the instructions and provisions in this manual might damage the unit, which might not work according to its specifications. This could lead to warranty cancelation.

Responsibility clause

NAVYLEC ANNECY ELECTRONIQUE declines responsibility due to misuse of the NL102 even if there are errors in this manual or in the case of use that is inconsistent with the purpose of the product.

WIRE LENGHT / CROSS-SECTION - CURRENT

Maximum length of wire usable according to the section according to the intensity having to cross it (Meters)

mm²	CURRENT (Amperes)																				
	1A	2A	3A	4A	5A	6A	7A	8A	10A	15A	20A	25A	30A	35A	40A	50A	60A	70A	80A	90A	100A
0,5	10	5	3,3	2,5	2,2	2															
1	19,6	10	6,6	4,9	3,9	3,3	2,8	2,4													
1,5	29	14,7	10	7,4	5,9	4,9	4,2	3,7	2,9												
2	39,3	19,6	13,1	10	7,9	6,6	5,6	4,9	3,9												
2,5	49,1	24,6	16,4	12,3	10	8,2	7	6,1	4,9	3,3											
3	58,9	29,5	19,6	14,7	11,8	10	8,4	7,4	5,9	3,9											
4	78,6	39,3	26,2	19,6	15,7	13,1	10	9,8	7,9	5,2	3,9										
5	98,3	49,1	32,7	24,5	19,6	16,4	14	10	9,8	6,5	4,9										
6	-	58,9	39,3	29,5	23,6	19,6	16,8	14,7	10	7,9	5,9	4,7									
7	-	68,8	45,8	34,4	27,5	22,9	19,6	17,2	13,8	10	6,9	5,5									
10	-	98,3	65,5	49,1	39,3	32,7	28	24,6	19,6	13,1	10	7,9	6,6	5,6	4,1						
15	-	-	98,3	73,7	58,9	49,1	42	36,8	29,5	19,6	14,7	11,7	9,8	8,4	7,4	6					
20	-	-	-	98,3	78,6	65,5	56,1	49,1	39,3	26,2	19,6	15,7	13,1	11,2	9,8	7,9					
25	-	-	-	-	98,3	81,9	70,2	61,4	49,1	32,7	24,6	19,6	16,4	14	12,3	9,8	8,2	7			
30	-	-	-	-	-	98,3	84,2	73,7	58,9	39,3	29,5	23,6	19,6	16,8	14,7	11,8	9,8	8,4			
35	-	-	-	-	-	-	98,3	85,9	68,8	45,8	34,4	27,5	22,9	19,6	17,2	13,7	11,4	9,8	8,6		
40	-	-	-	-	-	-	-	98,3	78,6	52,8	39,3	31,4	26,2	22,4	19,4	15,7	13,1	11,2	9,8		
50	-	-	-	-	-	-	-	-	98,3	65,5	49,1	39,3	32,7	28	24,6	19,6	16,4	14	12	10,9	9,8
60	-	-	-	-	-	-	-	-	-	78,6	58,9	47,2	39,3	33,7	29,5	23,6	19,6	16,8	14,7	13,1	11,8
70	-	-	-	-	-	-	-	-	-	-	68,8	55	45,9	39,3	34,4	27,5	22,9	19,6	17,2	15,3	13,7
95	-	-	-	-	-	-	-	-	-	-	-	74,7	62,2	53,3	46,7	37,3	31,1	26,7	23,3	20,7	18,7
120	-	-	-	-	-	-	-	-	-	-	-	-	78,6	67,4	58,9	47,1	39,3	33,7	29,5	26,2	23,6

Values at 40°C of temperature, under 12V, for a maximum of 3% voltage drop, flex-wire coppers multistranded - These values are more restrictive than those defined in appendix A according to ISO10133 Electric Systems - Small Craft

Meters maxi.

Notes :

The overall length of wire includes the total length positive and negative

For a use in 24V => multiply by 2 the length given in the table

For 40°C of temperature values and 6% of voltage drop => multiply by 2 the length given in the table

For 40°C of temperature values and 9% of voltage drop => multiply by 3 the length given in the table

For 40°C of temperature values and 12% of voltage drop => multiply by 4 the length given in the table

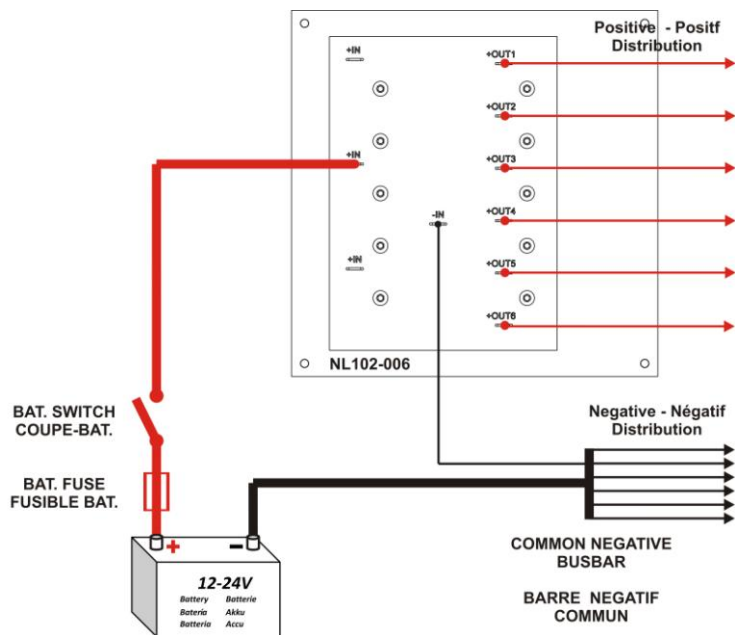


Fig. A : Standard installation or low current

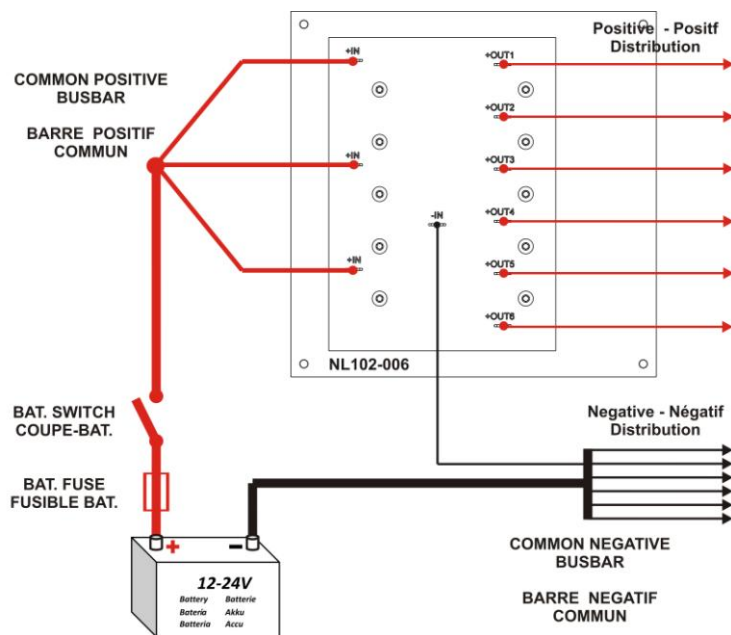
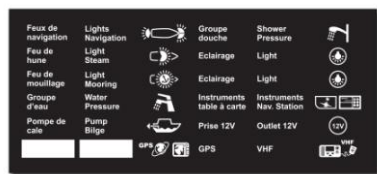


Fig. B : Optimum power distribution installation

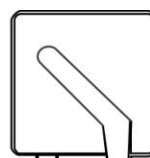
OPTIONS & TIME-CURRENT CURVE FOR AUTOMATIC RESETTABLE FUSES



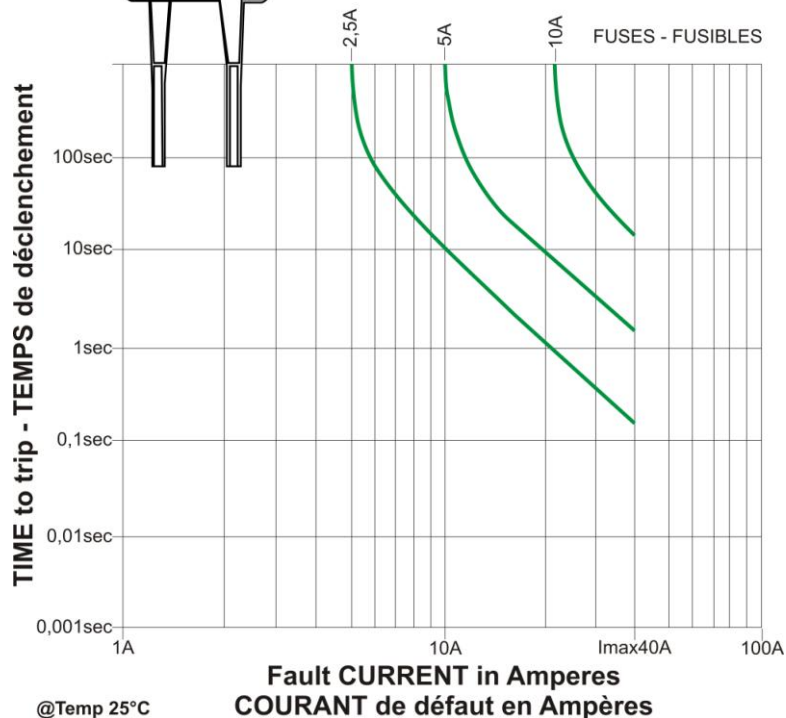
STANDARD STICKERS SUPPLIED
NL110-201

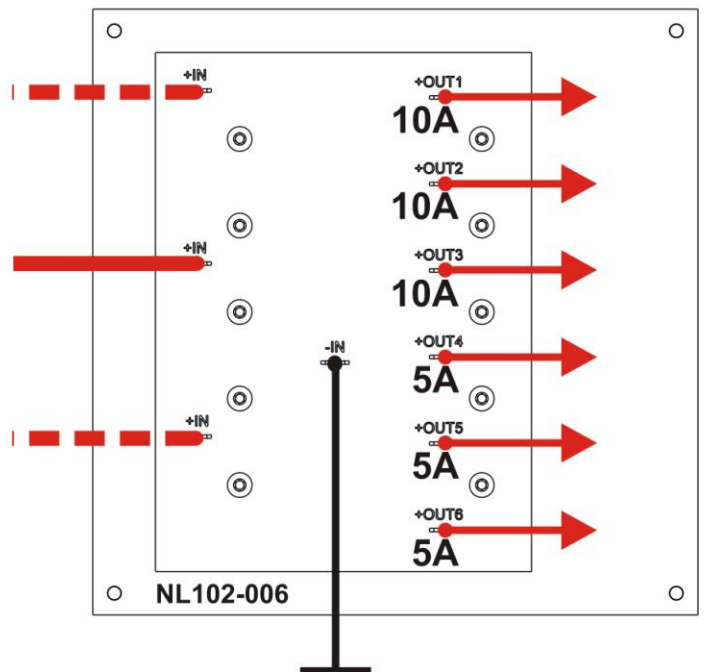
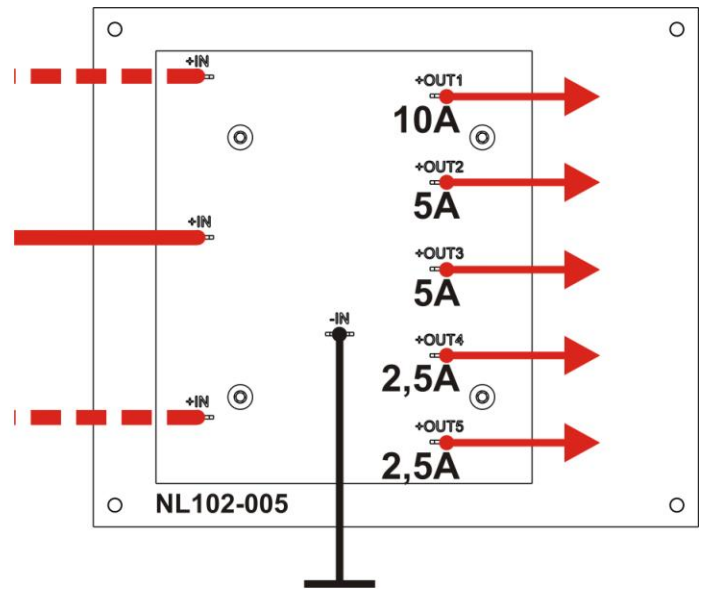
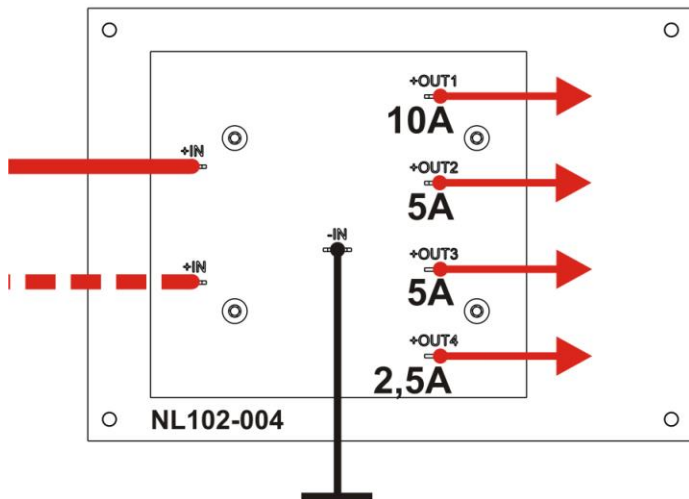
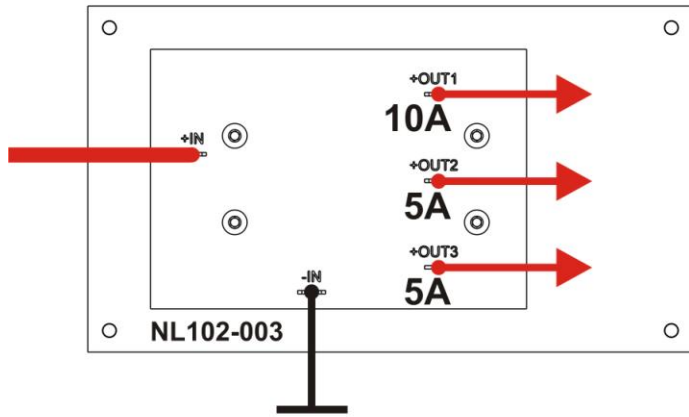
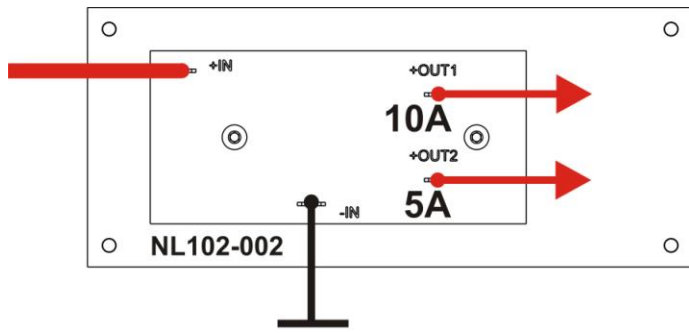


OPTIONAL LABELS SHEET FOR NL101
MATTER: STICKER VINYL LONG LIFESPAN, PRECUT, SIZE 22,6 X 9MM
NL110-101 132 STIKERS PICTOS
NL110-001 132 STIKERS FR FRENCH
NL110-002 132 STIKERS EN ENGLISH
NL110-003 132 STIKERS ES SPANISH



PTC RESETTABLE FUSES FUSIBLES PTC REARMABLES





Article Number	Input total Current +IN Permissible max.	Output +OUT Standard	Your functionalities
NL102-002	15A	10A	
		5A	
NL102-003	20A	10A	
		5A	
		5A	
NL102-004	22.5A	10A	
		5A	
		5A	
		2.5A	
NL102-005	25A	10A	
		5A	
		5A	
		2.5A	
NL102-006	45A	2.5A	
		10A	
		10A	
		10A	
		5A	
		5A	
		5A	

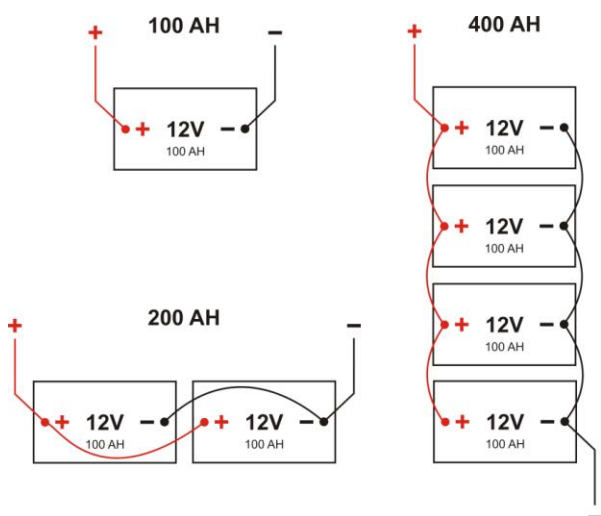
BATTERIES

The table below enables you to quickly identify the composition of a battery or a battery bank in 12V or 24V composed of one or more batteries for the most current configurations (also other batteries types in 4V or 8V exist).

Indeed to ensure a good electric distribution by the switchboard or a good measurement by Battery Monitors, NAVYLEC recommends you to check your installation for any installation of its equipment:

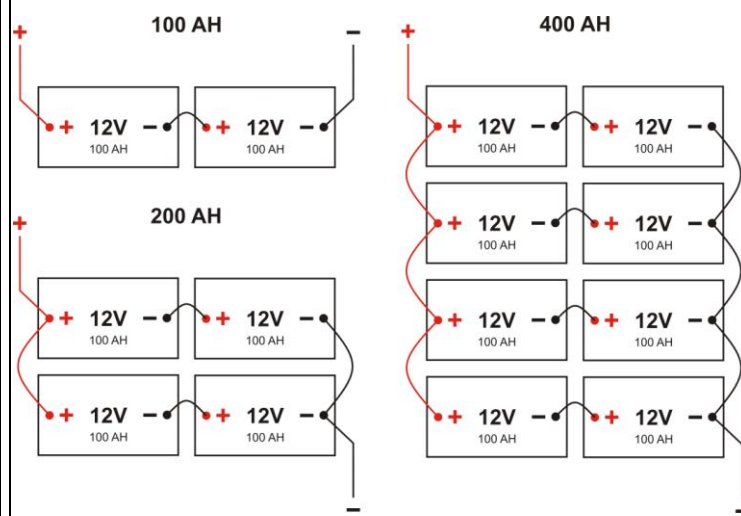
- It is important to respect the position of the connector industry input/output positive and negative to ensure the best distribution of load-consumption
- The component cables of the bridges inter batteries must be length and of section identical
- Replace any battery cable or terminal seeming defective
- The battery enclosure must be most moderate possible in temperature and sufficiently ventilated according to the battery type
- Any departure of battery (at source) must be protected by a general fuse (in the positive, according to the load intensity/consumption) and to have a switch system (ISO10133)

BATTERY 12V

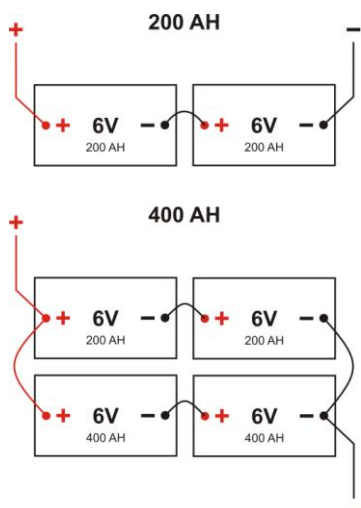


12V with 12V batteries (100AH)

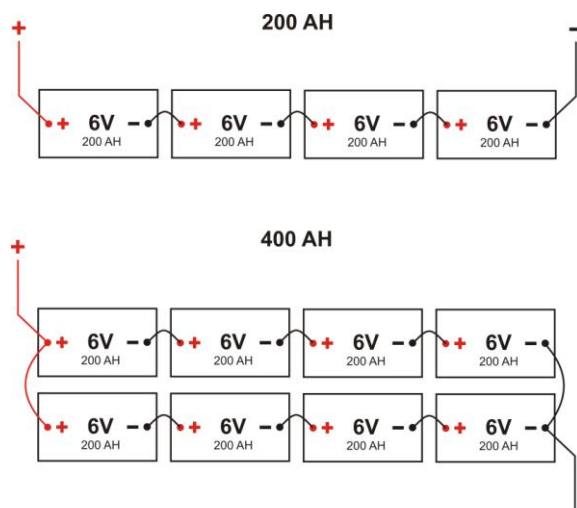
BATTERY 24V



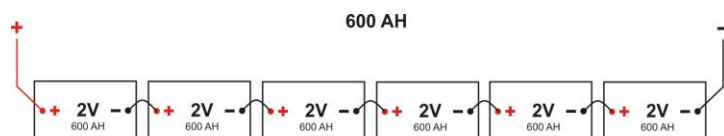
24V with 12V batteries (100AH)



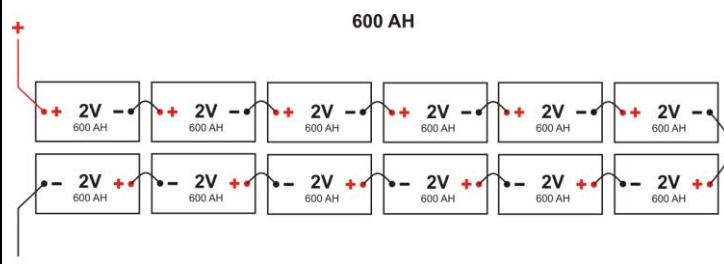
12V with 6V batteries (200AH)



24V with 6V batteries (200AH)



12V with 2V cells (600AH)



24V with 2V cells (600AH)