



# POWERSERVICE PSB

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User Manual

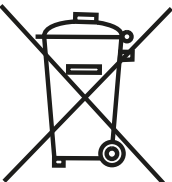
ENGLISH

## VALID FOR THE FOLLOWING MODELS

PSB 12-40  
PSB 12-80  
PSB 12/24-20  
PSB 12/24-40

PSB 24-30  
PSB 24-60  
PSB 24/12-40  
PSB 24/12-80

### **INSTRUCTIONS FOR THE PROPER DISPOSAL**



This electronic device is subject to the European Directive 2012/19/EU. according to the local waste disposal rules, do not dispose of old products with normal household waste. The proper disposal of products that can no longer be used prevents potential negative consequences for the environment and for the population.



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# 1. SAFETY INSTRUCTIONS

- Child Safety: keep the device Out of Reach.
- Check the device and connectors integrity.
- Always choose a well ventilated area to avoid overheating and possible fires.
- Do not place the device on highly flammable surfaces or environments (eg: paper, cloth, etc.).
- Do not cover the cooling fan on the side.
- Do not install the device near flooded batteries: they produce flammable, corrosive and explosive gas while working, and it can damage the product.
- Protect the device from sunlight or direct sources of heat.
- To avoid malfunctions, DO NOT install and use the device in very humid environments, in contact with water splashes, various liquids, or exposed to rain.
- To avoid risk of electric shock and/or fire, the vehicle's fuel system must be in good condition.
- In case of damaged connecting cables or inadequate section, immediately replace them with suitable cables as specified by this manual or by a qualified electrician.
- In case of anomalies in the conformity of the product do not use it! it is strictly forbidden to open the device. Repairs may only be carried out by qualified technical personnel using original spare parts.
- Keep the instruction manual near the device for easy access to the essential safety, use and maintenance information.
- The information contained in this manual may be changed without notice. NDS Energy s.r.l. reserves the right to make changes and improvements to the product at any time without notice and without obligation to apply these changes to the devices previously distributed.
- Product images are purely indicative and may therefore not be fully representative of the characteristics of the product, differing in colour, size or accessories.

## NOTE

It is indispensable, for a correct installation, to be equipped with suitable measuring instruments:

- Multimeter with DC voltage measurement (20V or autoscale) and continuity measurement.
- Amperometric clamp with direct current measurement (40A scale and higher).

## 2. PACKAGE CONTENTS

Check the contents of the package:

1x Power Service DC-DC Charger

1x STRIP HSB fuse 80A

1x STRIP HSB fuse 110A

## 3. DESCRIPTION

**POWERSERVICE**PSB, the best choice for energy independence!

With the **POWERSERVICE**PSB you can charge your batteries up to 80A in a very small size, this means that you will arrive at your destination with 100% charged batteries to power up the appliances like the air conditioner or the heater.

Unlike the vehicle alternator, the **POWERSERVICE**PSB is a real battery charger with proper charging curves for every commercial leisure battery: Lithium (LiFePO<sub>4</sub>), AGM, Gel, Wet. With the **OPTICHARGE** charging algorithm, developed by NDS, your batteries will be always perfectly charged and maintained for a long lasting life. After starting the vehicle engine, the **POWERSERVICE**PSB will receive the D+ (or Ignition+)

signal and start monitoring the Starter battery voltage to check the State of Charge. With a voltage higher than **13.3V**, or **26.6V** for 24-24 versions, the **POWERSERVICE**PSB will start charging the leisure batteries.

During the charging phase, the starter battery voltage will be constantly monitored to avoid any supply problem or overload to the alternator. If necessary, the **POWERSERVICE**PSB will reduce the output current or stop the charge completely. The output current will be limited if the **POWERSERVICE**PSB detects an active signal D+ (or Ignition+) and a starter battery voltage below 13V.

The **POWERSERVICE**PSB switches off completely if the starter battery voltage drops to 12.8V and the signal D+ or Ignition+ (ie engine shutdown) is no longer detected (different thresholds for Smart Alternator Euro6).

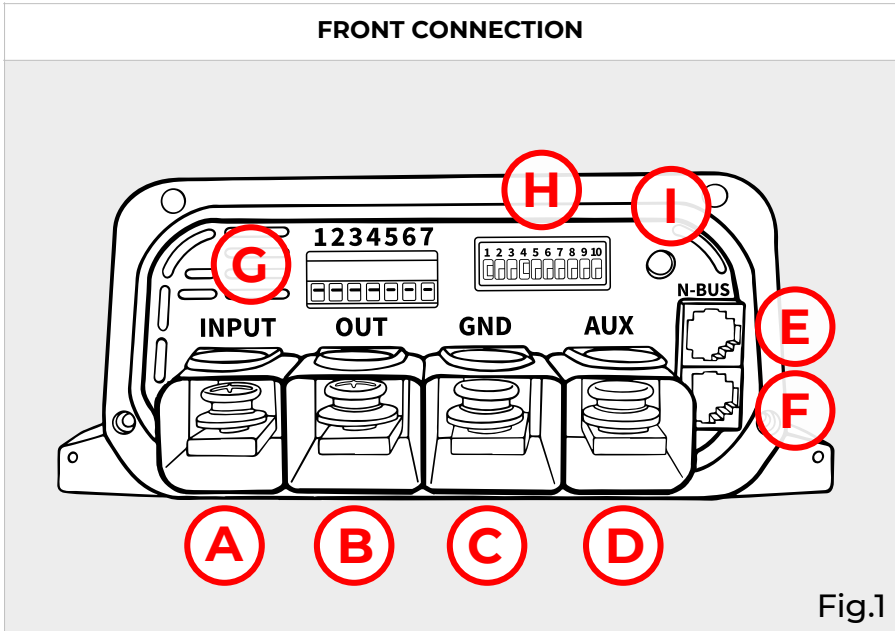
The **AUX connection** makes installation simple and intuitive, even with an existing electrical system: the Control Unit, or any other appliances system, installed on the leisure battery, can be switched to the AUX connection without changing the wiring system. it's quick and easy!

**POWERSERVICE**PSB is fitted with the new **N-BUS communication and connection protocol**: now you can connect and control all the allowed devices with a simple cable, and manage them with one control only, the **DTB01 touch screen display**. If there is a N-BUS bluetooth device in the same network you can also use the NDS mobile App for iOS and Android.

## MAIN FEATURES

- Up to 80A of charge in a very small size.
- High efficiency, up to 97%.
- Charge management with microcontroller.
- 7 charging steps with **OPTICHARGE** firmware.
- Selectable charging curve: AGM, Gel, Wet, lithium (LiFePO<sub>4</sub>).
- AUX connection for maximum charging power to the leisure batteries, and easy installation even with existing and preinstalled systems.
- Split-Charge relay separates Starter and leisure batteries.
- Compatible with Smart Alternator Euro 6 vehicles.
- Alternator protection (in case of overload).
- Fan speed regulated by temperature and operating power, for a silent and efficient device.
- Electronic and fuse protections.
- Emergency switch reverts to original charging system in case of failure.
- Battery temperature sensor for battery temperature monitoring during the charge.
- Output voltage sensing during the charge, directly on the battery poles, to always supply the maximum power and correct voltage level.
- Quiet, compact and easy to install.

# 4. STRUCTURE



REFERENCE	FUNCTION
A	Starter battery positive pole
B	Leisure battery positive pole
C	Batteries and vehicle negative connections
D	AUX connection
E	N-BUS connection 1
F	N-BUS connection 2
G	Terminal block connector (Fig. 3)
H	Dip-switch selector (Fig. 4)
I	Led indicator (Chapter 12)



## BACK CONNECTION

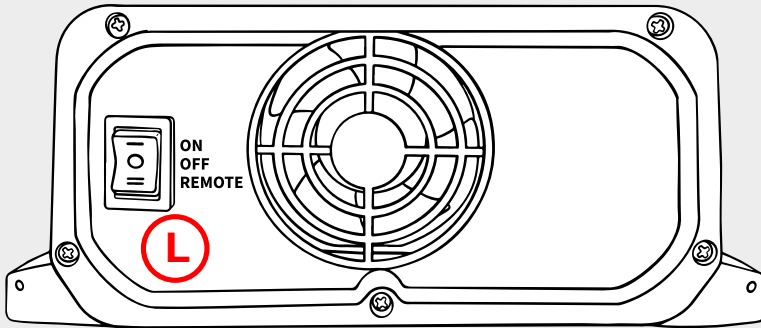


Fig.2

### REFERENCE

### FUNCTION

L

ON / OFF / Remote Switch

## DIP SWITCH SETUP (REF. G)

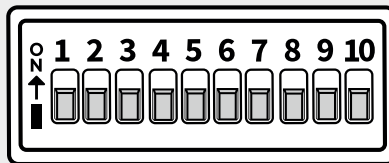


Fig.3

### DIP SWITCH

### FUNCTION

1

Alternator type setup (Traditional or Smart Euro6)

2-3-4

Charging curve selection

5

Silent mode ON/OFF

6

Input current limit ON/OFF

7-8

Output current limit level selection

9-10

Not used

## TERMINAL BLOCK (REF. H)

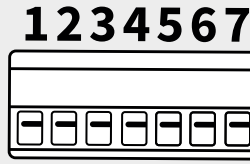


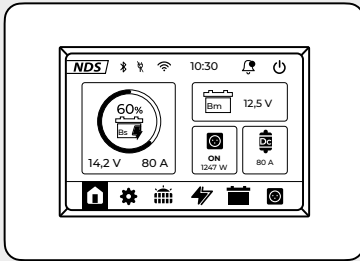
Fig.4

CONNECTION	FUNCTION
1	D+ or Ignition+ signal from the alternator
2	+Sense output voltage
3	-Sense output voltage
4	Temperature sensor connection 1
5	Temperature sensor connection 2
6	Not used
7	Remote charging status signal

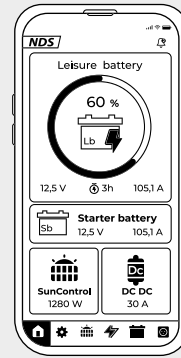
## 5. CONTROLLERS

You can control the **POWERSERVICE** PSB and all **N-BUS** devices with a single Touch Screen full color Display (**DTB01**), or with the mobile app if there is, at least, one NDS device with Bluetooth within the N-BUS network. Bluetooth devices are e.g. **SUNCONTROL2** (models with Bluetooth) and **TEMPRA Lithium Battery** (all models). The mobile app can also be used to update all **N-BUS** devices if there is a master device in the network, such as the **TEMPRA Lithium Battery**.

## DISPLAY

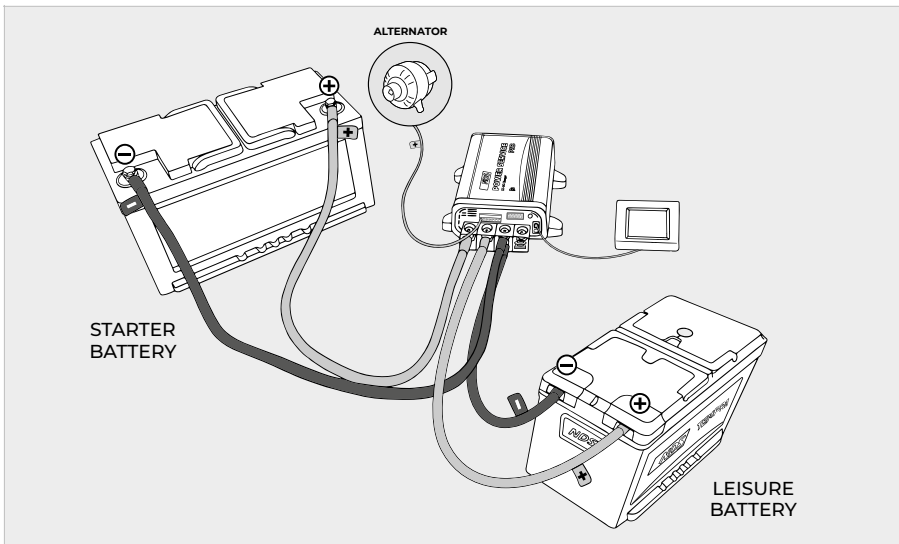


## APP MOBILE



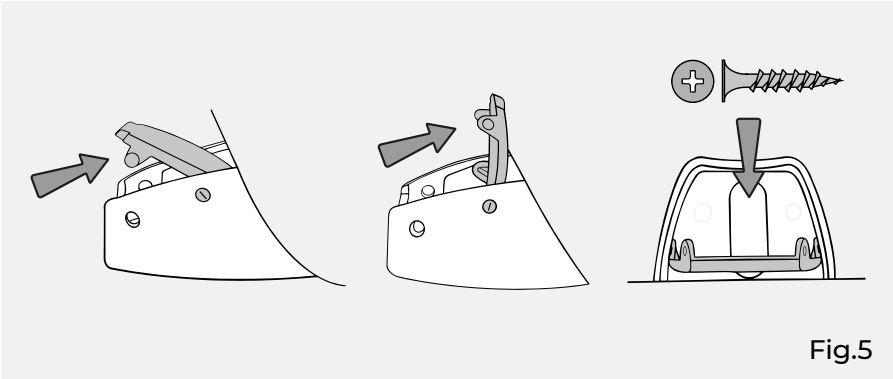
# 6. INSTALLATION

Installing the **POWERSERVICEPSB** is easy but some connections could change especially on the AUX connection (Pin. D). The following draw is a broad pattern to explain the basic connections of the **POWERSERVICEPSB**. Please ask a technician to carry out the installation correctly and consult the specific circuit diagrams.

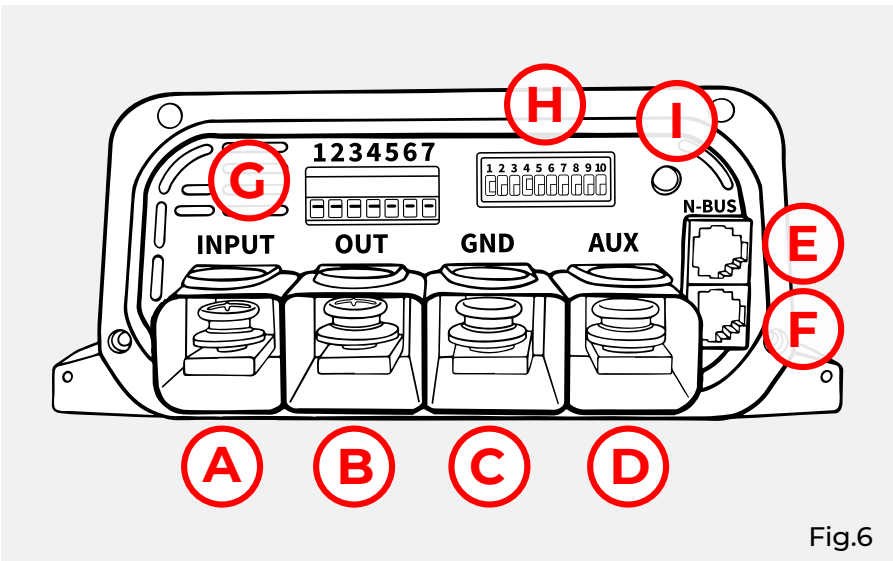


## STANDARD CONNECTION EXPLANATION

1. Make sure that the vehicle's engine and/or the battery chargers are switched off.
2. Set the **POWERSERVICE** PSB switch Button (Ref.L) to 0 position.
3. Lift the plastic cap covering the mounting brackets located to the **POWERSERVICE** PSB side (Fig.5).



4. Fix the **POWERSERVICE** PSB on a flat surface using suitable screws.



5. Connect the Starter battery negative pole to the **POWERSERVICE** PSB Ref. C (GND)
6. Connect the fuse holder to the positive pole of the starter battery.
7. Connect the other end of the fuse holder to Ref. A (input) of the **POWERSERVICE** PSB.
8. Insert a fuse into the fuse holder (depending on **POWERSERVICE** PSB model).
9. Connect the fuse holder to the leisure battery positive pole.
10. Connect the other end of the fuse holder to the **POWERSERVICE** PSB. Ref. B.
11. Insert a 80A fuse into the fuse holder.
12. Connect the **D+** or **ignition+** signal wire to the **POWERSERVICE** PSB Terminal Block (Ref. G) Pin n°1.
13. [Optional] Connect the output voltage control **+Sense** from Terminal Block Pin n°2 connector to the leisure battery positive pole, and the **-Sense** from Terminal Block pin n°3 to the leisure battery negative pole, using a 1mm<sup>2</sup> cable section. This connection will reduce the voltage drop on power cables during the charge process, by a device electronical control.

## 7. AUX CONNECTION (REF. D)

The **AUX** connection can be used only for the models: **PSB12-40, PSB12-80, PSB24-40, PSB24-60.**

The **POWERSERVICE** PSB AUX connection (Ref. D) can speed up the battery charging process, and make the device installation easier than ever. To install, just move the cable on the leisure battery's positive terminal to the AUX connection and you have done.

### **NOTE**

For vehicles without Control unit (converted vehicles), and/or a vehicle with a new electrical system, you can use the AUX input (Ref. D) as well. Please install an external "split-charge relay": in case of malfunctions it will takes power directly from the alternator.

The **AUX** connection can be used for:

- RV control unit output (eg CBE, Sargent, Schaudt, Nord Elettronica, etc...).
- Split-charge relay.
- Appliances such as the fridge, lights, pump, etc.

How it works:

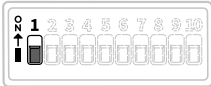
- **Engine OFF and D+ (or ignition+) not active** - Appliances powered by the leisure batteries.
- **Engine ON and D+ (or ignition+) attivo** - Appliances powered directly by the alternator.


**NOTE**

If you choose the ignition+ signal instead of the D+ one, please remember to start the engine as soon as possible.

## 8. ALTERNATOR TYPE SETUP

Please set the Dip Switch according to your vehicle alternator type.

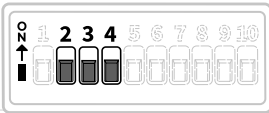
STANDARD ALTERNATOR CONFIGURATION		
Dip switch setup	Activation threshold	Deactivation threshold
	13,3 V	12,7 V

SMART ALTERNATOR CONFIGURATION		
Dip switch setup	Activation threshold	Deactivation threshold
	11,7 V	11,25 V

# 9. CHARGING CURVE SETUP

The **POWERSERVICE** PSB supports the charging of lithium iron phosphate (LiFePO<sub>4</sub>), lead/acid (AGM, Gel, Wet) leisure batteries with appropriate charging curves. Use the Dip-Switches (Fig.3 - Ref. G), numbers 2, 3, 4, to select the desired charging curve.

## A Curve: GEL



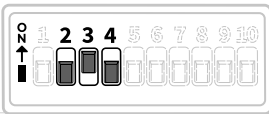
	12V	24V
Max voltage (Vabs.)	14,2V	28,4V
Float voltage (Vfloat)	13,5V	27,0V
Max desulfation voltage	OFF	OFF

## B Curve: Wet



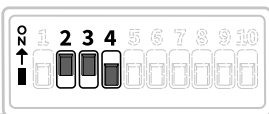
	12V	24V
Max voltage (Vabs.)	14,4V	28,8V
Float voltage (Vfloat)	13,8V	27,6V
Max desulfation voltage	OFF	OFF

## C Curve: AGM /1



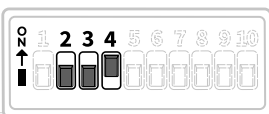
	12V	24V
Max voltage (Vabs.)	14,7V	29,4V
Float voltage (Vfloat)	13,6V	27,2V
Max desulfation voltage	OFF	OFF

## D Curve: AGM /2



	12V	24V
Max voltage (Vabs.)	14,7V	29,4V
Float voltage (Vfloat)	13,6V	27,2V
Max desulfation voltage	15,6V	31,2V

## E Curve: LiFePO<sub>4</sub> /1



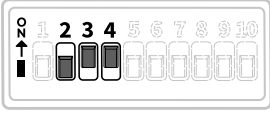
	12V	24V
Max voltage (Vabs.)	14,5V	29,0V
Float voltage (Vfloat)	13,8V	27,6V
Max desulfation voltage	OFF	OFF

## F Curve: LiFePO<sub>4</sub> /2



	12V	24V
Max voltage (Vabs.)	14,5V	29,0V
Float voltage (Vfloat)	OFF	OFF
Max desulfation voltage	OFF	OFF

### G Curve: LiFePO<sub>4</sub> /3



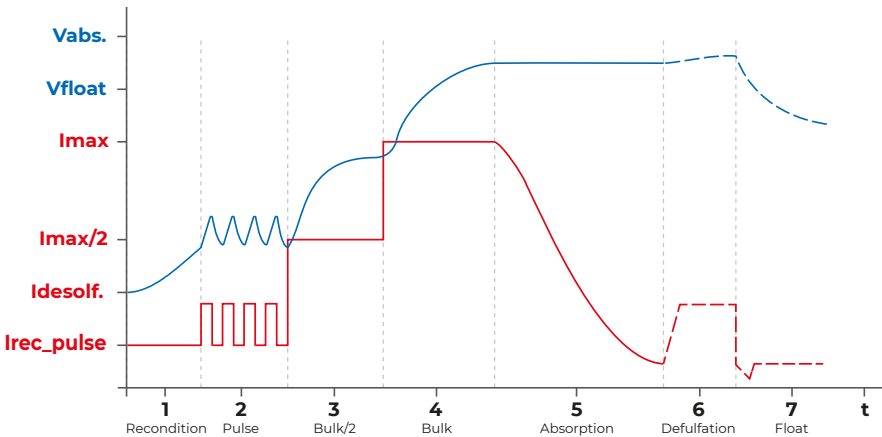
	12V	24V
Max voltage (Vabs.)	14,2V	28,4V
Float voltage (Vfloat)	13,6V	27,2V
Max desulfation voltage	OFF	OFF

### H Curve: LiFePO<sub>4</sub> /4



	12V	24V
Max voltage (Vabs.)	14,2V	28,4V
Float voltage (Vfloat)	OFF	OFF
Max desulfation voltage	OFF	OFF

## CHARGING CURVE DIAGRAM



### NOTE

Remember to set the Proper Alternator Type using the first Dip switch. Chapter 8.



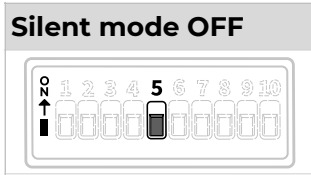
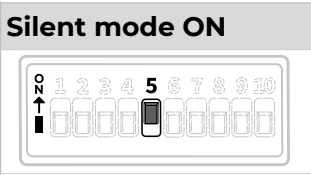
# 10. EXTRA SELECTIONS

Dip switches 5,6,7,8 are dedicated to some extra selections for the **POWERSERVICE**PSB setup.

## Dip Switch 5: silent mode

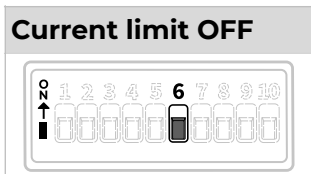
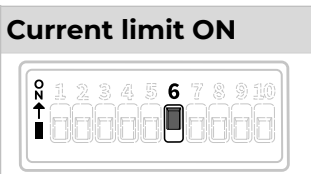
Useful if you don't want to be disturbed by the **POWERSERVICE**PSB's cooling fan or alarm and you have low power consumption. By activating this mode, the maximum charging current may be reduced by the **POWERSERVICE**PSB to safeguard its integrity.

Silent mode can be activated from the dip switch on the **POWERSERVICE**PSB, or via the display and/or mobile app if a Bluetooth N-BUS device is present in the N-BUS network (such as Tempra Lithium Battery)



## Dip Switch 6: input current limit



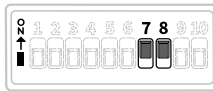
This setting limits the input current to the **POWERSERVICE**PSB by 50% please see the table below for more details. It can be useful when the power source (e.g.: Alternator) is not so powerful, this setting can be activated in order not to stress the system. This function can only be activated by the Dip Switch 6, can not be activated by the Controller (DTB01 or App).



Model	Max. input current	Limited input current
PSB12-40	55A	30A
PSB12-80	95A	50A
PSB24-30	55A	30A
PSB24-60	75A	40A
PSB12/24-20	60A	30A
PSB12/24-40	95A	55A
PSB24/12-40	40A	20A
PSB24/12-80	55A	25A

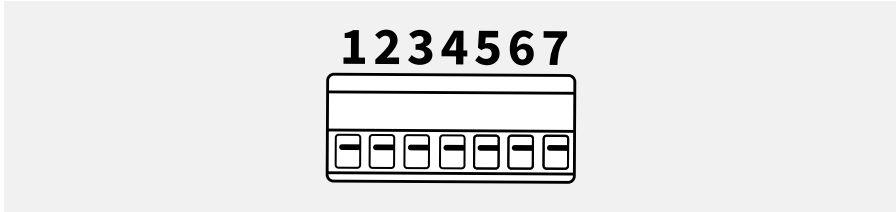
## Dip Switches 7-8: output current limit selection

For each model you can choose between three output currents, see the table below for mode details. This setting can be useful in case the maximum output current exceeds the recommended values for charging leisure batteries, as might happen with AGM or Lead/Acid batteries in general.

	Dip switch Set1	Dip switch Set2	Dip switch Set3
Model			
PSB12-40	40A	30A	20A
PSB12-80	80A	60A	40A
PSB24-30	30A	20A	15A
PSB24-60	60A	45A	30A
PSB12/24-20	20A	15A	10A
PSB12/24-40	40A	30A	20A
PSB24/12-40	40A	30A	20A
PSB24/12-80	80A	60A	40A

# 11. TERMINAL BLOCK (REF. H)

The Terminal Block is essential for the proper functioning of the **POWERSERVICE**PSB.



## 1. **D+ or Ignition+** from the alternator

Using the **D+ Signal** is safer, **POWERSERVICE**PSB will be turned on only when the vehicle engine is running, so if the engine is not running, the Starter battery will be safe. If you choose the **Ignition+ signal**, always remember to start the engine when you insert the key, otherwise the **POWERSERVICE**PSB could draw energy from the Starter battery.

Activation threshold	Deactivation threshold
11 V	8 V

## 2. **+Sense Output voltage**

This pin can be connected to the leisure battery **positive pole** using a 1mm<sup>2</sup> cable section.

With this connection, **POWERSERVICE**PSB is able to adjust the output voltage to compensate the voltage drop occurring on the battery cables, optimizing the entire charging process.

## 3. **-Sense Output voltage**

This pin can be connected to the leisure battery **negative pole** using a 1mm<sup>2</sup> cable section.

With this connection, **POWERSERVICE**PSB is able to adjust the output voltage to compensate the

voltage drop occurring on the battery cables, optimizing the entire charging process.

4. **Temperature sensor - Connection 1**

**Connection Pins 4 and 5 have no polarity and can be connected to the temperature probe either way.**

The use of external temperature probes (TS002) is optional but allows the **POWERSERVICE**PSB to make automatic micro-adjustments to the charging curve, variable according to battery temperature, for optimal charging even in complex situations.

5. **N-BUS** devices with integrated temperature monitoring, such as the **TEMPRA Lithium Battery**, do not require external probes usage; the of data exchange and the charging curve micro-adjustments, take place automatically.

6. **Temperature sensor - Connection 2**

**Connection Pins 4 and 5 have no polarity and can be connected to the temperature probe either way.**

7. Not used.

8. **Remote Charging Status Signal**

This output pin generates a 0V e 12V signal that notifies the **POWERSERVICE**PSB status.

**0V** = **POWERSERVICE**PSB not active.

**12V** = **POWERSERVICE**PSB charging.

## **12.LED INDICATOR (REF. I)**

**POWERSERVICE**PSB is equipped with one LED indicator to show the device working status (Fig. 3 - Ref. I).

Led signals:

- **SOLID RED LIGHT** - Battery charging. Voltage higher than 12V.
- **SOLID ORANGE LIGHT** - Battery deep discharged. Voltage lower than 12 V (charging phase 1 and 2).
- **SOLID GREEN LIGHT** - Battery completely charged (charging phase 7).
- **RED LED BLINKING WITH AN INTERMITTENT BEEPING** - Internal fuse broken.

*Replacing this kind of fuses takes time and requires experience, please contact your dealer first.*

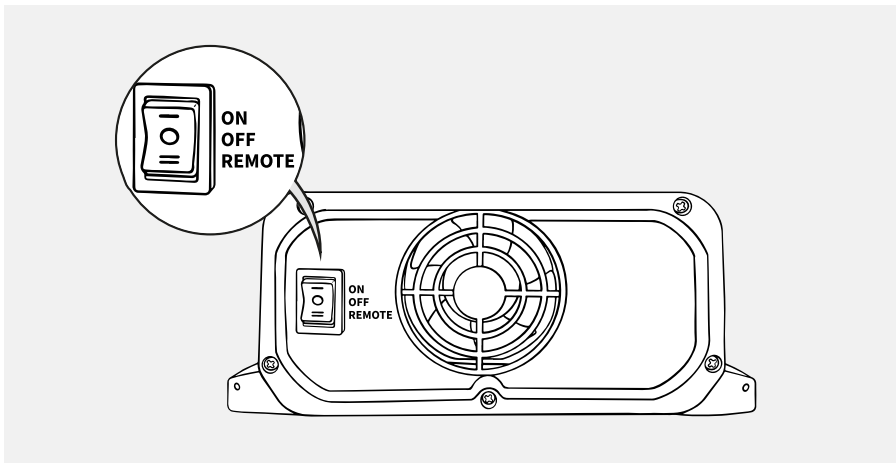
## 13.THREE WAY SWITCH (REF.L)

**POWERSERVICE** PSB can be switched on and off, and can also be managed by a controller (App or display bus DTB01) using the three way switch.

**1 = On, device is on.**

**0 = Off, device is off.**

**2 = Device managed by a remote controller (Display DTB01, App mobile, other devices).**



# 14.EXTERNAL FUSE

External fuses must be installed very close to the battery poles. The characteristics of the fuse to be purchased, depend on the Power Service PSB model. Refer to the table below for optimal installation.

<b>PSB Model</b>	<b>Input fuse</b> (Starter battery positive pole)	<b>Output fuse</b> (Leisure battery positive pole)
<b>PSB 12-40</b>	<b>60A - 70A</b>	<b>50A - 60A</b>
<b>PSB 12-80</b>	<b>100A - 125A</b>	<b>90A - 100A</b>
<b>PSB 24-30</b>	<b>60A</b>	<b>40A</b>
<b>PSB 24-60</b>	<b>80A</b>	<b>70A - 80A</b>
<b>PSB 12/24-20</b>	<b>60A - 70A</b>	<b>25A - 30A</b>
<b>PSB 12/24-40</b>	<b>100A - 125A</b>	<b>50A - 60A</b>
<b>PSB 24/12-40</b>	<b>40A - 50A</b>	<b>50A - 60A</b>
<b>PSB 24/12-80</b>	<b>60A</b>	<b>90A - 100A</b>

# 15.POWER CABLE SECTION

These are power cables:

- Connection between the Starter battery positive terminal and Ref. A of the PSB (fig. 1).
- Connection between Leisure battery positive pole and Ref. B of the PSB (fig. 1).
- Connection between the negative poles of the two batteries and Ref. C of the PSB (fig. 1).

The cross-section to be chosen depends on the **POWERSERVICE** PSB model and also on the length of the cables themselves.

Refer to the table below for a rough indication and consult a professional installer for a safe installation.

PSB model	MINIMUM CABLE SECTION		
	$l \leq 2 \text{ m}$ Input/Output	$2\text{m} < l \leq 4 \text{ m}$ Input/Output	$l > 4 \text{ m}$ Input/Output
<b>PSB 12-40</b>	16mm <sup>2</sup> /16mm <sup>2</sup>	25mm <sup>2</sup> /25mm <sup>2</sup>	35mm <sup>2</sup> /35mm <sup>2</sup>
<b>PSB 12-80</b>	35mm <sup>2</sup> /35mm <sup>2</sup>	50mm <sup>2</sup> /50mm <sup>2</sup>	100mm <sup>2</sup> /100mm <sup>2</sup>
<b>PSB 24-30</b>	16mm <sup>2</sup> /10mm <sup>2</sup>	25mm <sup>2</sup> /16mm <sup>2</sup>	35mm <sup>2</sup> /25mm <sup>2</sup>
<b>PSB 24-60</b>	35mm <sup>2</sup> /25mm <sup>2</sup>	50mm <sup>2</sup> /35mm <sup>2</sup>	100mm <sup>2</sup> /50mm <sup>2</sup>
<b>PSB 12/24-20</b>	25mm <sup>2</sup> /16mm <sup>2</sup>	35mm <sup>2</sup> /16mm <sup>2</sup>	100mm <sup>2</sup> /25mm <sup>2</sup>
<b>PSB 12/24-40</b>	35mm <sup>2</sup> /16mm <sup>2</sup>	50mm <sup>2</sup> /25mm <sup>2</sup>	100mm <sup>2</sup> /35mm <sup>2</sup>
<b>PSB 24/12-40</b>	16mm <sup>2</sup> /16mm <sup>2</sup>	25mm <sup>2</sup> /25mm <sup>2</sup>	35mm <sup>2</sup> /35mm <sup>2</sup>
<b>PSB 24/12-80</b>	35mm <sup>2</sup> /35mm <sup>2</sup>	50mm <sup>2</sup> /50mm <sup>2</sup>	100mm <sup>2</sup> /100mm <sup>2</sup>

## 16.SYSTEM OPERATION CHECK

After the **POWERSERVICE** PSB installation, an operation test is required. The leisure battery must be at 75% of the capacity, so please use the battery with some appliances to reach the required State Of Charge.

### ALTERNATOR CHARGING CHECK-UP

1. Turn off the engine.
2. Use a voltmeter to check the leisure battery voltage.
3. Check if the Dip-Switch combination for the battery requirements (Chapter. 8) and for the alternator's type (traditional or smart) are correct.
4. Turn on the **POWERSERVICE** PSB switch to position 1 (Ref. L).

5. Turn on the engine.
6. When the LED lights up RED or ORANGE, the charge starts.
7. Check the leisure battery voltage with the voltmeter and compare it to the previous measurement. The voltage must be higher then before.
8. After 2 minutes verify with a Clamp Meter that the **POWERSERVICE**PSB maximum current data are as declared (this phase could last a few seconds if the leisure battery is completely charged).
9. With a voltmeter check the Starter battery voltage to the battery poles, and compare it the voltage between **POWERSERVICE**PSB Positive Terminal Ref.C (fig.1) and the negative one Ref.A (fig.1): the difference between the two connections should be **0.7V** maximum. If the voltage difference is higher then 0.7V, please use a larger cross section cable to connect to **POWERSERVICE**PSB Terminal Ref.A to the starter battery. It may also be necessary to improve the ground (GND) connection (Ref.C). **During this phase always take the measurement while the engine is running.**

## 17.MAINTENANCE

We periodically recommend:

- Clean the external surface to prevent the dust and dirt accumulation.
- Check that the input connections and the battery poles are tight and secure.
- Make sure that the ventilation slots are not obstructed by dirt or any material.



# 18.FUSE REPLACEMENT

**POWERSERVICE** PSB units are electronically protected and there are also protections fuse for the input and output terminals.

Please don't open the device case, any tampering with the product could irreparably damage it and, in any case, invalidate the warranty. Replacing the internal fuses is a task for specialized laboratories.

# 19.TECHNICAL DETAILS

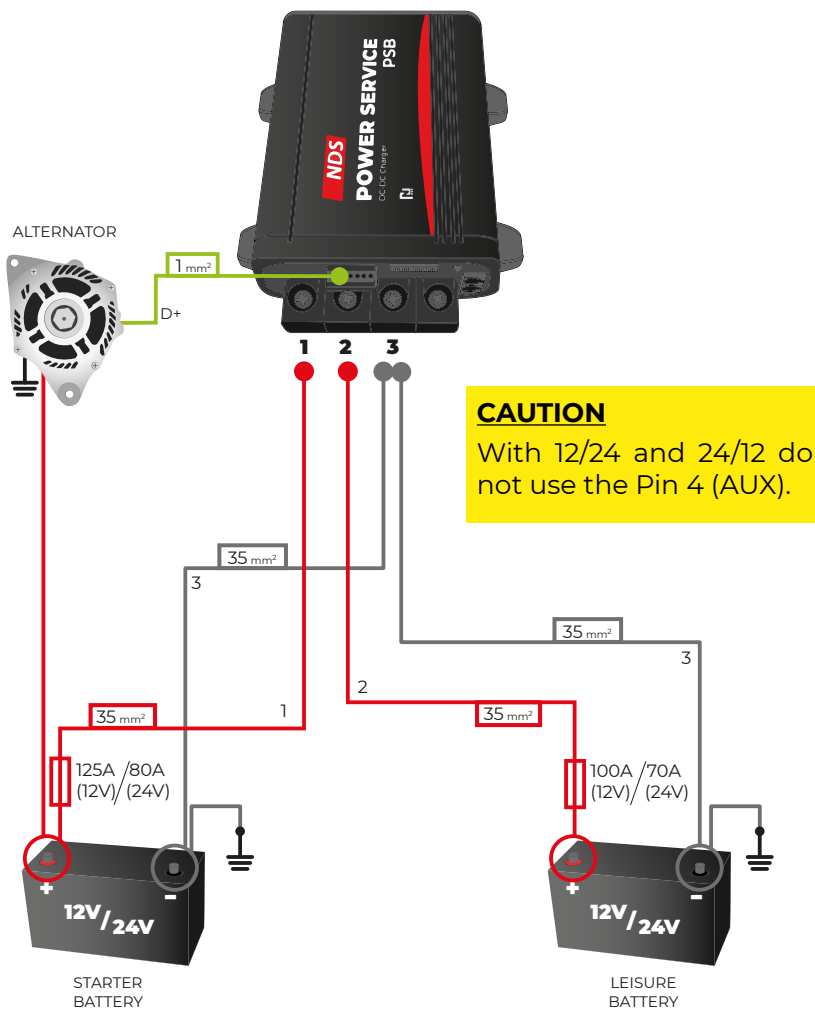
MODEL	PSB12-40 PSB12-80	PSB24-30 PSB24-60	PSB12/24-20 PSB12/24-40	PSB24/12-40 PSB24/12-80
Input Voltage (Range)	12VDC (9V-16V)	24VDC (18V-32V)	12VDC (9V-16V)	24VDC (18V-32V)
Number of Inputs	1			
Number of outputs	1			
Max Input Voltage	35VDC			
Output Voltage (Range)	12VDC (9V-16V)	24VDC (18V-32V)	24VDC (18V-32V)	12VDC (9V-16V)
output charge current "xx"	40A / 80A	30A / 60A	20A / 40A	40A / 80A
Peak efficiency	97%			
Self consumption in standby	<4mA			

<b>MODEL</b>	PSB12-40 PSB12-80	PSB24-30 PSB24-60	PSB12/24-20 PSB12/24-40	PSB24/12-40 PSB24/12-80
Charging algorithm	OptiCharge with 7 stages			
Temperature compensation	Yes (-24mV/°C)			
Battery temperature probe	TS002 for the Leisure battery			
<b>CHARGING ACTIVATION THRESHOLD (D+ SIGNAL ACTIVE)</b>				
DIP 1 => OFF	>13,3V	>26,6V	>26,6V	>26,6V
DIP 1 => ON	>11,7V	>23,4V	>23,4V	>23,4V
<b>CHARGING DEACTIVATION THRESHOLD (D+ SIGNAL INACTIVE)</b>				
DIP 1 => OFF	<12,7V	<25,4V	<25,4V	<25,4V
DIP 1 => ON	<11,2V	<22,4V	<22,4V	<22,4V
Operating temperature	-20°C to +60°C (with thermal derating)			
Humidity	95% non condensing			
Communication protocol	N-BUS and CI-BUS			

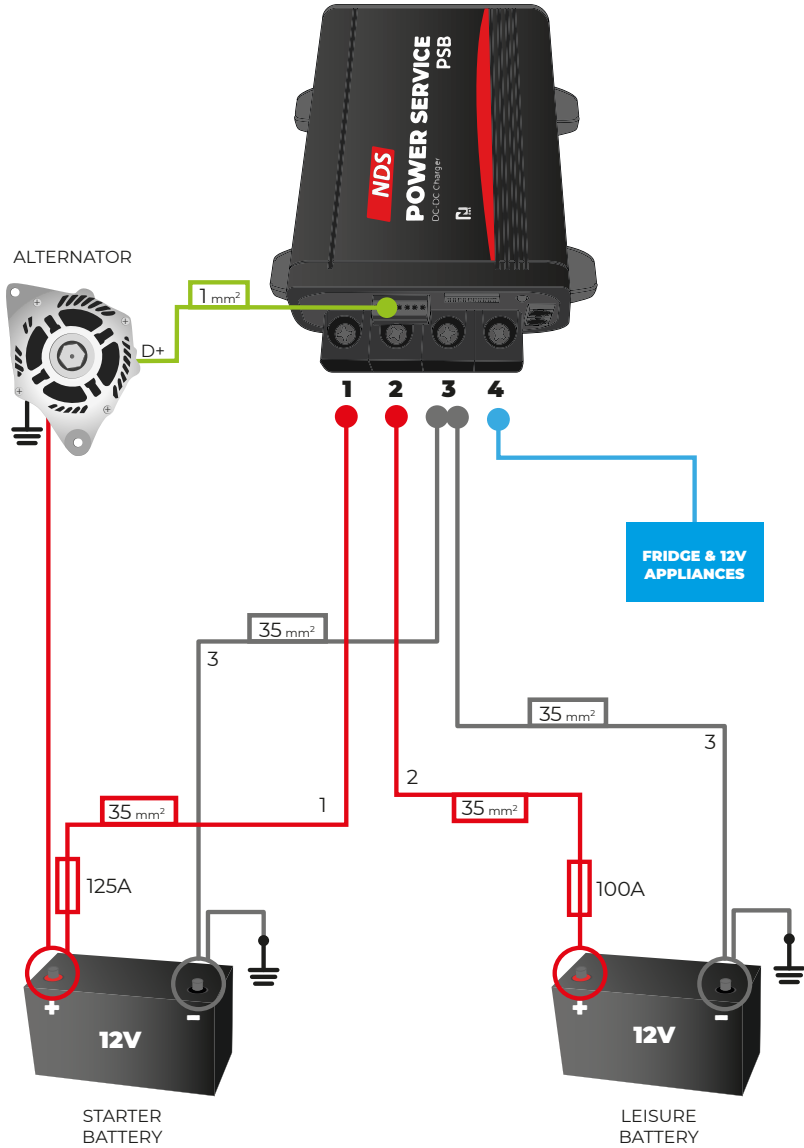
<b>MODEL</b>	PSB12-40 PSB12-80	PSB24-30 PSB24-60	PSB12/24-20 PSB12/24-40	PSB24/12-40 PSB24/12-80
Fan assisted cooling	Yes (Speed controlled)			
Power supply function	Yes			
<b>ENCLOSURE</b>				
Color and material	Black ABS+PC UL94 V0 Black Anodized Aluminium			
Power terminal	4 Positions M8 Screws up to 50mm <sup>2</sup> /1AWG			
Protection category	IP21			
Weight	1080g			
Dimensions	210x191x75mm			
<b>STANDARDS</b>				
Emission	EN 61000-6-3, EN 55014-1			
Immunity	EN 61000-6-2, EN 61000-6-1, EN 55014-2			
Automotive Directive	ECE R10-6			

# 20. WIRING DIAGRAMS SAMPLES

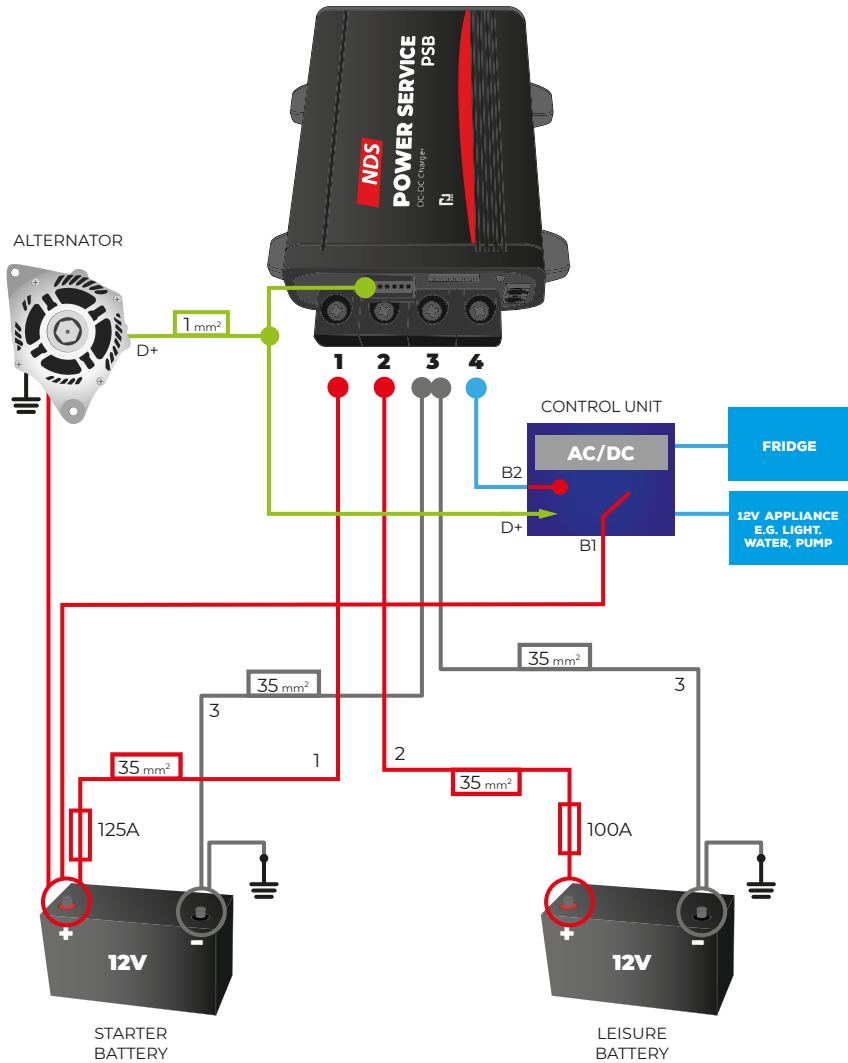
## BASIC INSTALLATION WITH 12V OR 24V BATTERIES



# VEHICLES WITHOUT CONTROL UNIT OR WITH A SPLIT CHARGE RELAY



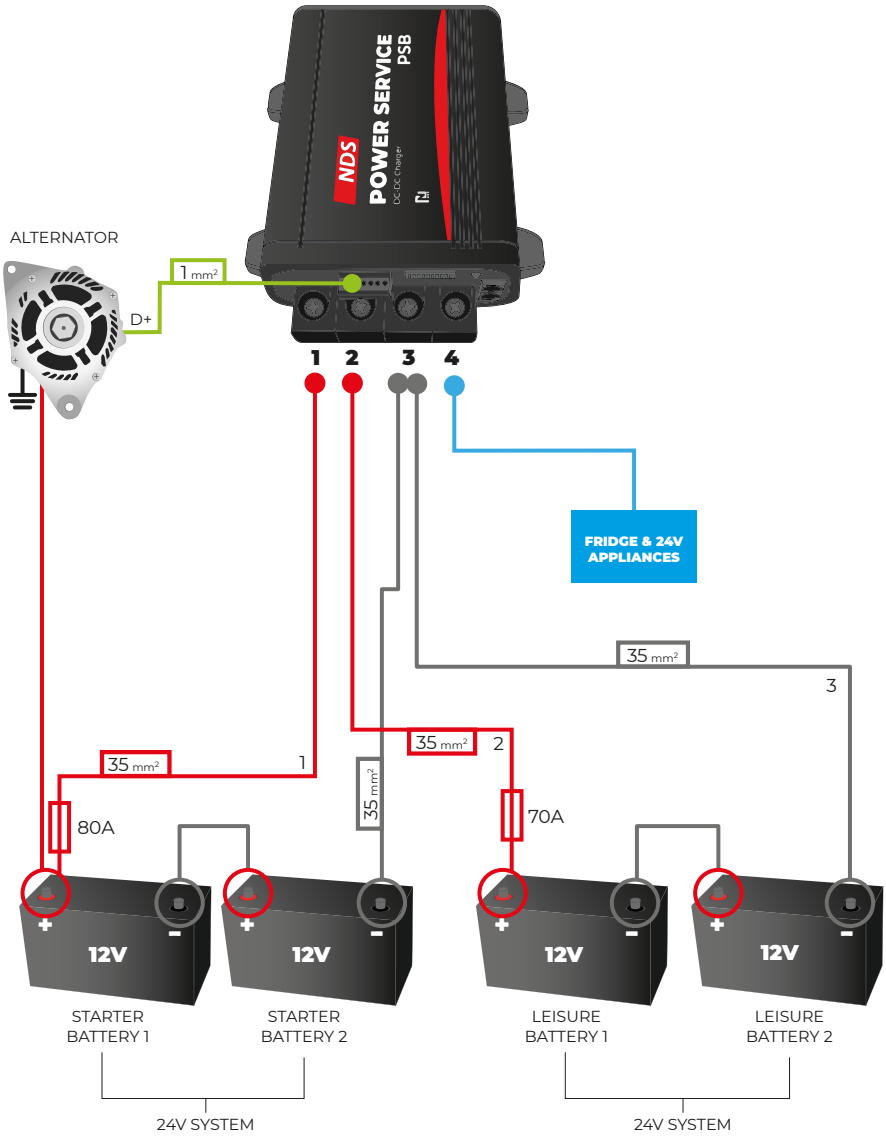
# VEHICLE WITH CONTROL UNIT ALREADY INSTALLED (CHARGING SYSTEM)



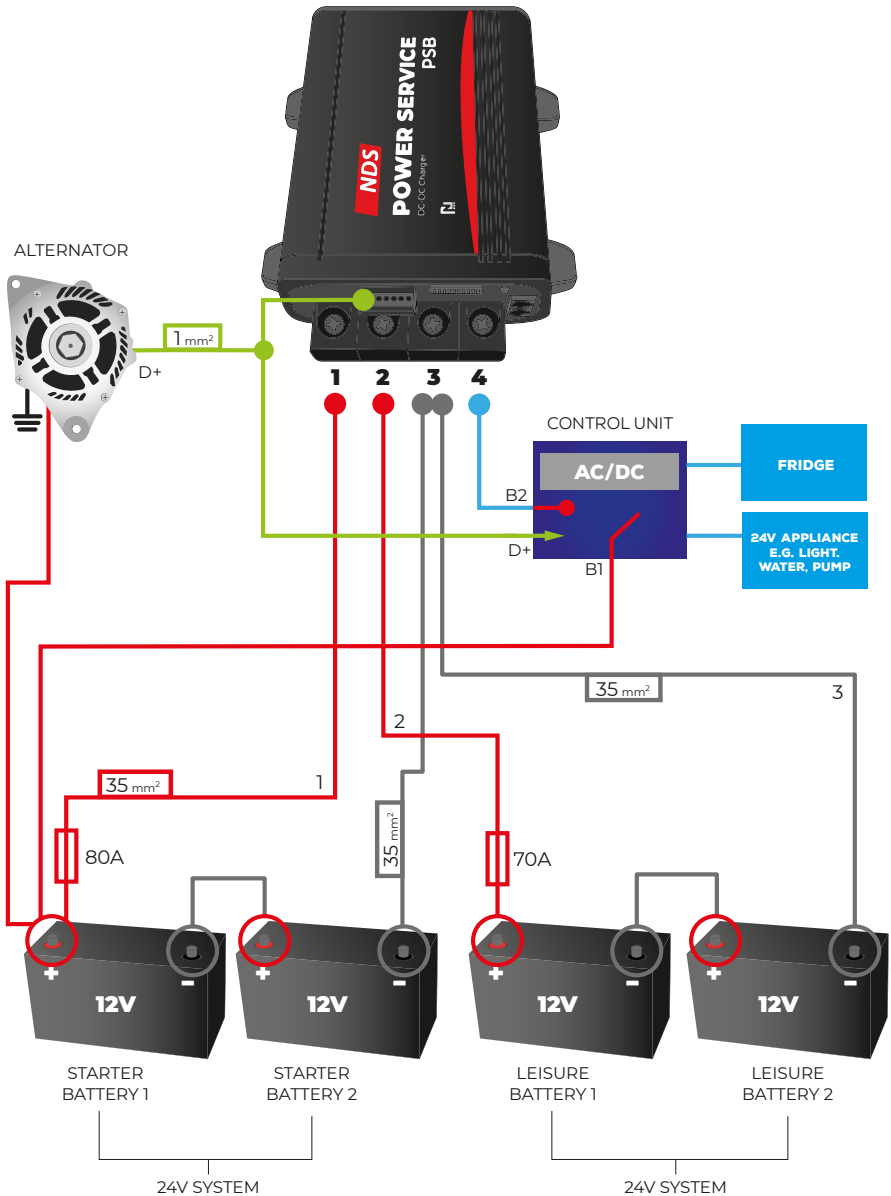
## **NOTE**

Any combination of input and output system voltages is allowed (Es: 12V In / 12V Out, 12V In / 24V Out, 24V In / 12V Out, 24V In / 24V Out)

# 24V ELECTRICAL SYSTEM (WITH 24V LEISURE AND STARTER BATTERY) ON A VEHICLE WITHOUT CONTROL UNIT OR SPLIT CHARGE RELAY



# 24V ELECTRICAL SYSTEM (WITH 24V LEISURE AND STARTER BATTERY) ON A VEHICLE WITH CONTROL UNIT





# DECLARATION OF EU CONFORMITY - POWER SERVICE PSB

Company: NDS ENERGY S.R.L.  
Address: Via giovanni pascoli  
65010 - cappelle sul tavo (PE)  
Italy

Dichiara sotto la propria responsabilità che il prodotto:

**Commercial Name: POWER SERVICE BASIC**

**Models: PSB12-40, PSB12-80,  
PSB24-30, PSB24-60,  
PSB12/24-20, PSB12/24-40,  
PSB24/12-40, PSB24/12-80**

To which this declaration refers, is in compliance with the provisions of the Directive of the Council of the European Union concerning the electromagnetic compatibility (EMC) **Directive 2014/30/EC**, demonstrated to the observance of the following norms:

- ✓ EN 55014-1:2017+A11:2020
- ✓ EN 55014-2:2015
- ✓ EN IEC 61000-3-2:2019
- ✓ EN 61000-3-3:2013+A1:2019
- ✓ EN IEC 61000-6-1:2019
- ✓ EN IEC 61000-6-2:2019
- ✓ EN IEC 61000-6-3:2021

Compliance for the restriction of the use of hazardous substances is demonstrated in compliance with **Directive 2011/65/EU (RoHS 2)**:



Cappelle sul Tavo,  
14/06/2022

Administrator and Legal representative

**NDS ENERGY S.R.L.**  
*Mattia Di Stefano*

# 21.WARRANTY



## WARRANTY COUPON

FIRST NAME \_\_\_\_\_

SURNAME \_\_\_\_\_

POSTCODE \_\_\_\_\_

E-MAIL \_\_\_\_\_

MODEL \_\_\_\_\_

SERIAL NUMBER \_\_\_\_\_

PURCHASE DATE \_\_\_\_\_

STAMP AND SIGNATURE OF THE  
SELLER

I CONSENT TO THE ACTIVITY DESCRIBED IN POINT 3.C OF THE INFORMATION NOTICE ON [WWW.NDSENERGY.IT/PRIVACY-POLICY/](http://WWW.NDSENERGY.IT/PRIVACY-POLICY/)

**NDS ENERGY S.R.L.**

VIA G. PASCOLI, 96/98

65010 CAPPELLE SUL TAVO (PE)

ITALY

EMAIL: [CUSTOMER@NDSENERGY.IT](mailto:CUSTOMER@NDSENERGY.IT)

TEL: +39 085 4470396

FAX: +39 085 9112263

ITALY

# NOTES





**ALL THE ENERGY YOU NEED**  
TUTTA L'ENERGIA CHE TI SERVE



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**NDS ENERGY S.R.L.**

VIA PASCOLI, 96/98

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