Deutronicstraße 5, 84166 Adlkofen / Germany
Tel.: +49 (0) 8707 920-199
Fax: +49 (0) 8707 1004
E-Mail: sales@deutronic.com
http://www.deutronic.com

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DBL75 – 14 Smart Charger

For 12V LiFePO4- and all types of 12V lead-acid batteries

-Operating Instructions-

The DBL 75-14 is a microprocessor controlled trickle charger for battery care of automotive batteries. Equipped with an intelligent, adaptive charging- and regeneration process and automatic battery chemistry detection. It is suitable for all types of 12V lead-acid batteries including GEL and AGM, also for 12V LiFePO4 batteries. It is able to recognition lightly sulphated lead-acid batteries. The battery charger automatically detects type of battery and automatically selects an ideal charging process.

****Please read this manual carefully and follow the instructions****

Smart Charger **DBL75 - 14**

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Important Safety Instructions

- This charger is designed for only maintain above-named battery types.
- For indoor use only.
- Explosion hazard: A battery being charged could emit explosive gases. Therefore avoid smoking or open sparks or naked flames in the vicinity of the battery.
- Does not cover the charger while charging; allow good ventilation to the charger.
- Danger of chemical burns: battery acid is highly corrosive.
- If your skin or eyes come into contact with acid, immediately rinse the affected part with excessive water and seek medical attention.
- Do not charge a frozen battery.
- Do not charge a damaged battery.
- Disconnect battery from charger which is not connected to AC mains socket.
- Do not recharge non-rechargeable batteries
- If the cord is damaged, the trickle charger should be scrapped.
- For safety reasons, it is recommended to check the charging operation from time to time, when it is intended to keep the charger connected for longer period of time.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

When charging mounted automotive battery:

- The battery terminal not connected to the chassis has to be connected first. The other connection is to be made to the chassis, remote from the battery and fuel line. The battery charger is then to be connected to the supply mains.
- After charging, disconnect the charger from the supply mains. Then remove the chassis connection first followed by the battery connection.
- Low temperature LED is only glowing, when charger detects need for adjusted charging process.

Attention: For safety reasons regeneration procedure has to be done under surveillance!

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Safety Instructions:

1. Save these instructions.
This manual contains important safety and operating instructions.

2. Do not expose charger to rain or snow.

3. Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons.

4. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.

5. An extension cord should not be used unless absolutely necessary. Use of improper extension cord may result in a risk of fire and electric shock. If extension cord must be used, make sure:
a) That pins on plug of extension cord are the same number, size, and shape as those of plug on charger.
b) That extension cord is properly wired and in good electrical condition.
c) That wire size is large enough for AC ampere rating of charger.

6. Do not operate charger with damaged cord or plug – replace the cord or plug immediately.

7. Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman or service center.

8. Do not disassemble charger; take it to a qualified serviceman or service center when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.

9. To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or clearing. Turning off controls will not reduce this risk.

10. WARNING – Risk of explosive gases:
a) Working in the vicinity of a lead-acid battery is dangerous: Batteries generate explosive gases during normal battery operation: For this reason, it is of utmost importance that each time before using your charger you read this manual and follow the instructions exactly.
b) Reduce risk of battery explosion; follow these instructions and those published by battery manufacturer and manufacturer of any equipment you intend to use in vicinity of battery. Review cautionary marking on these products and on engine.

11. Personal Precautions
a) Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
b) Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
c) Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
d) If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.
e) Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause explosion.
f) Remove personal metal items such as rings, bracelets, necklaces, and watches when working with lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or similar metal items, causing a severe burn.

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g) Use charger for charging above-named battery types only. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
h) NEVER charge a frozen battery

12. Preparing to charge
a) If it is necessary to remove battery from vehicle to charge, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off, so as not to cause an arc.
b) Be sure area around battery is well ventilated while battery is being charged. Gas can be forcefully blown away by using a piece of cardboard or other non-metallic material as a fan.
c) Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
d) Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. This helps purge excessive gas from cell. Do not overfill. For a battery without cell-caps, carefully follow manufacturers recharging instructions.
e) Study all battery manufacturer‘s specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
f) Determine voltage of battery by referring to car owner‘s manual and make sure it matches output rating of battery charger.

13. Charger location
a) Locate charger as far away from battery as DC cables permit. Never place charger directly above battery being charged. Gases from battery will corrode and damage charger.
b) Never allow battery acid to dip on charger when reading gravity or filling battery.
c) Do not operate charger in a closed-in area or restrict ventilation in any way.
d) Do net set a battery on top of charger.

14. DC connection precautions
a) Connect and disconnect dc output clips only after setting any charger switches to “off” position and removing ac cord from electric outlet. Never allow clips to touch each other.
b) Attach clips to battery and chassis as indicated in 15(f), 15(g), 16(c), and 16(d).

15. Follow these steps when battery is installed in vehicle. A spark near battery may cause battery explosion: To reduce risk of spark near battery:
a) Position ac and dc cords to reduce risk of damage by hood, door, or moving engine part.
b) Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
c) Plug in the charger to AC mains.
d) Check polarity of battery posts POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, -) post.
e) Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to chassis (as in most vehicles), see 15(f). If positive post is grounded to the chassis, see 15(g).
f) For negative-grounded vehicles, connect POSITIVE (RED) clip from battery charger to POSITIVE (POS, P, +) ungrounded post of battery. Connect NEGATIVE (BLACK) clip from battery charger far from battery with chassis or engine block. Do not connect clip to carburator, fuel lines, or sheet-metal body parts. Connect to a big and thick chassis or engine block metal piece.
g) For positive-grounded vehicle, connect NEGATIVE (BLACK) clip from charger to NEGATIVE (NEG, N, -) ungrounded post of battery. Connect POSITIVE (RED) clip from battery charger far from battery with chassis or engine block. Do not connect clip to carburator, fuel lines, or sheet-metal body parts. Connect to a big and thick chassis or engine block metal piece.
h) When disconnecting charger, plug off the charger to from AC mains and then remove clips from chassis and battery terminal.

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16. Follow these steps when battery is outside vehicle. A spark near the battery may cause battery explosion. To reduce risk of spark near battery:

a) Plug in the charger to AC mains.

b) Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.

c) Attach at least a 24-inch long (61cm) 6-guage (AWG) insulated battery cable to NEGATIVE (NEG, N, -) battery post.

d) Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.

e) Position yourself as far away from the battery as possible and then connect NEGATIVE (BLACK) charger clip to free end of battery cable.

f) When disconnecting charger, first plug off the charger from AC mains and then do go on in reverse sequence of connecting procedure. Disconnect the first connection while positioned as far away from the battery as possible.

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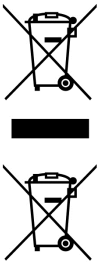
WEEE Notice



Disposal of Waste Electrical and Electronic Equipment and/or Battery by users in private households in the European Union. This symbol on the product or on the packaging indicates that this can not be disposed of as a household waste. You must dispose of your waste equipment and/or battery by handling it over to the applicable take-back scheme for the recycling of electrical and electronic equipment and/or battery. For more information about recycling of this equipment and/or battery, please contact your city office, the shop where you purchased the equipment or your household waste disposal service. The recycling of materials will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and environment.

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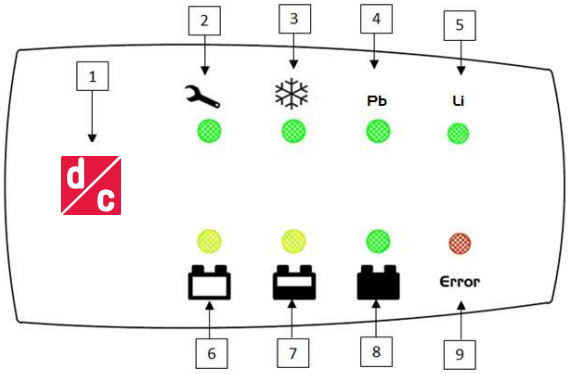
Control Panel



LED / BUTTON	FUNCTION
d/c	**Select Pre-conditioning:** Via Pre-conditioning (Pre current) batteries with terminal voltage >7VDC can be charged. ATTENTION: In standard mode charging starts just above 11,2VDC terminal voltage!
🔧	**Preconditioning or full charge is active**
❄	**Battery charging at low ambient temperature (<10°C) is active**
Pb	**Lead-acid battery detected – Charging Mode for lead-acid batteries is active** Attention: Light on just at power transmission, not when monitoring!
Li	**LiFePO4 battery detected – Charging Mode for LiFePO4 batteries is active** Attention: Light on just at power transmission, not when monitoring!
	Battery empty (terminal voltage for signalling „Battery empty“ depends on result of battery detection)
	Battery half-full (terminal voltage for signalling „Battery half-full“ depends on result of battery detection)
	Batterie full (terminal voltage > 13,4VDC)
Error	**Application error / Device fault**

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Device Status

Explanation	LED Signalling*
Turn-on delay	LED 2 lights permanently
Desulphation	LED 2, 4, 5 and 6 light permanently
SoC-detection	LED 4, 5, 6, 7 and 8 light permanently
Battery-chemistry-detection	LED 6 or 7 or 8 as well as 4 and 5 light permanently
Batterie full	LED 8 lights permanently
Batterie half-full	LED 7 lights permanently
Batterie empty	LED 6 lights permanently
Charging mode Lithium	LED 6 or 7 or 8 as well as LED 5 light permanently
Charging mode lead-acid	LED 6 or 7 or 8 as well as LED 4 light permanently
Full charge	LED 8 lights permanently
Battery examination	LED 6 or 7 or 8 light permanently
Undervoltage on Output (Ubat<7VDC)	LED 9 is flashing
No load on Output	LED 6 is flashing
Application error (e.g. reverse polarity)	LED 9 is flashing
Device fault	LED 9 lights permanently
Battery voltage too low (Ubat<Uesp)	LED 6 and 9 are flashing
Pre-Conditioning	LED 2, 4, 5 and 6 light permanently
Battery fault	LED 9 lights permanently

** Low ambient temperature (LED3) can be signalized simultaneous at every device status.*

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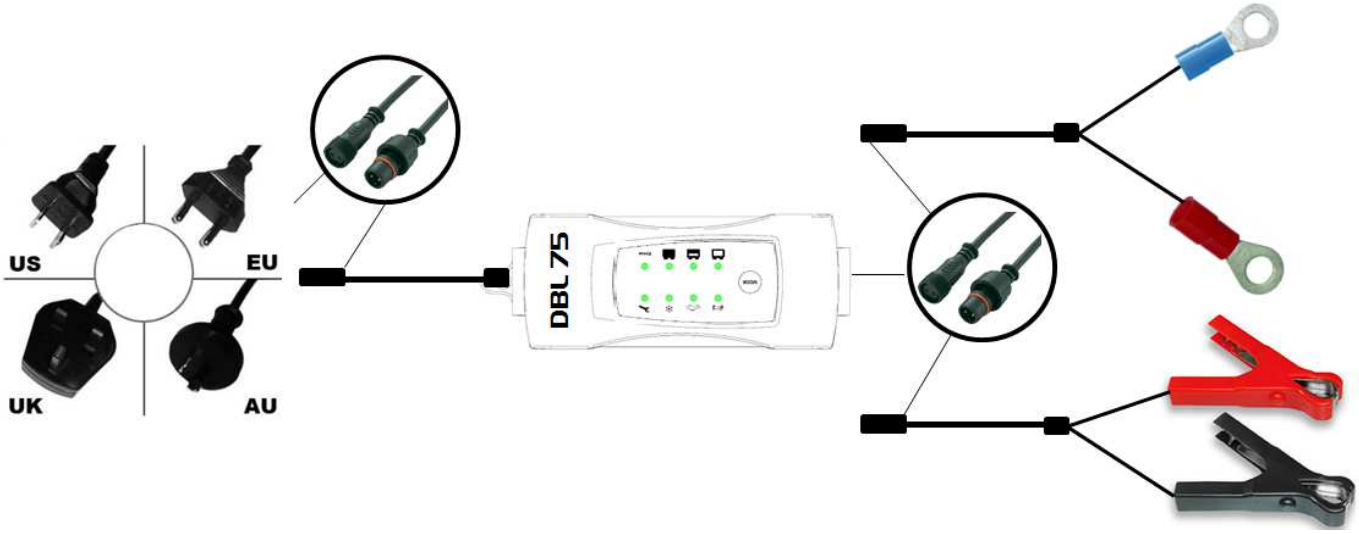
Connectors



Operation

Connect

1. (Only CE version) Choose the correct AC power cable and connect it with the charger.
2. Connect the red output lead to the positive terminal of the battery and the black lead to the chassis or in case of a disconnected battery to the negative battery terminal or with the vehicle charging points when available.
3. Plug in the charger to AC mains (100~240V AC).
4. LED's flowing in a circle are signalling charger self-test.
5. The DBL 75-14 automatically starts analyzing the battery followed by the charging or maintenance process.

Disconnect/Power off

When you disconnect the battery charger from the battery during the charging mode LED 6 will be flashing. To turn the battery charger off the power cable has to be pulled out of the mains socket.

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Procedure

Power on
The device will start when the DBL is connected to the mains supply.
The following situations can occur.

No Battery is connected:	The device is in load detection. LED 6 is flashing.
The Battery is connected:	The device starts the charging and monitoring process.
Application error (e.g. reversed polarity)	The error will be detected and signaled by flashing LED 9.
Device error	The error will be detected and signalled by flashing LED 9.

Temperature test
Before the charging process starts the temperature will be tested. The temperature will be measured in the charger. Should the temperature be less than 10°C the device switches in low temperature mode. This mode will be signalled by LED 3.

Pre-conditioning of deep discharged batteries
Deep discharged batteries (7VDC<UBat<11,2VDC) it is possible to select and start via keystroke [Button 1 for 5 seconds] the pre-conditioning mode (pre-current). The start of pre-conditioning is signalized by LEDs 2, 4, 5 and 6 light permanently. After successful conclusion of pre-conditioning the battery charger automatically starts with analyzing and charging the battery.
Attention: Due to safety reasons only start this process under supervision!

Desulphation
Desulphation helps to increase the power consumption for aged Pb batteries. This procedure lasts maximum 20 minutes and will be signalled by LEDs 2, 4, 5 and 6.

Charging Pb/Li
During the charging process a constant voltage and a maximum current value will be given. The charging process will be interrupted when the power falls below a certain threshold value.
The charging for Li batteries will be signalled by LED 5.
The charging for Pb batteries will be signalled by LED 4.

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Regeneration

The regeneration mode is intended to refresh Pb batteries. It starts after the Pb battery is charged. After maximum 240 minutes the regeneration mode will be interrupted.

Battery test

The charger performs automatically in cyclical intervals a battery test. In this test the voltage of the connected battery will be measured and evaluated.

Full charge of the battery (clamping voltage > 13,4VDC)

When a fully charged battery will be connected the charging process will not start. LED 8 signals that the battery is fully charged.

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Safety Features

Spark prevention:
The DBL75-14 will not begin charging process before load (battery) was detected on charger output.

Reverse polarity protection:
If the polarity is reversed by wrong connection of the output cables, the charger doesn't start charging process. This is signalled by LED 9 lights permanently. Once the terminals are re-connected correctly, the charger automatically starts charging process.

Short circuit protection:
If the charger is short circuited on the output terminals, the charging process doesn't start. This is signalled by LED 6 lights permanently.

Over temperature protection:
To prevent damage of the charger the output power of the charger will be continuously controlled depending on the temperature when the charger gets too hot.

Battery testing during active charging process:
During active charging process the battery periodically is tested by the charger depending on battery voltage. Will the charger detect battery fault charging process automatically will be stopped. This is signalled by LED 9 lights permanently.

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Error messages

Type of fault	**Signalling**
Reversed polarity *The output cable was connected in reversed polarity to the battery.*	LED 9 flashes rapidly
Undervoltage on the output *The battery voltage is less than 7VDC.*	LED 9 is flashing
External voltage is too high *The applied battery voltage is too high.*	LED 9 flashes rapidly twice and flashes slowly once
External voltage is too low *The applied battery voltage is between 7VDC and 11,2 VDC.*	LED 6 and 9 are flashing
Invalid battery voltage *The applied battery voltage is under 2,5VDC.*	LED 9 is flashing
Low battery *During the battery test a battery fault was detected.*	LED 9 is flashing
Device error	LED 9 lights permanently

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Technical Data

Input voltage	100-240V, 50/60Hz~, 1.5A
Max. charging current	13,8 VDC / 1A cont. 12,0 VDC / 5A, 10 min.
Max. power	75W
Efficiency	>75%
Max. output voltage	16 VDC
Suitable battery types	Lead-Acid, Gel, AGM / 6 Cells / 12V / 7Ah – 120Ah LiFePo4 / 4 Cells / 12V / 7Ah – 120Ah
Charging process	Intelligent, adaptive charging process with automatic PB-/Li-detection.
Safety	CE version: EN60335-1(CE-LVD); EN60335-2-29 UL version: UL1310; CSA CS22.2 No. 223-15
Case	Splash-proof, polycarbonate case
Dimensions (DxWxH)	150x60x30mm