ATiB ELETTRONICA

DDL-150 USB

User Manual

IT Manuale d'uso e manutenzione
EN **Use and maintenance manual**
FR Manuel d'utilisation et d'entretien
ES Manual de utilizo y mantenimiento
DE **Gebrauchs- und Wartungsanleitung**

DDL – Use and maintenance manual

1. INTRODUCTION

The Battery Discharger DDL 150 is an innovative device designed to test the battery discharge working on nominal voltages from 2 up to 80V and on discharging currents up to 150A.
 Thanks to its ergonomics and robustness, it can be used in any working ambient and easily moved through its transport wheels.

1.1   Technical details

Parameter	Specification
Voltage detected	from 2V to 80V
Discharge current available	from 2A to 150A
Ac Mains	230 Vac ± 10%
Operative temperature	−10 +40°C
Weight	32 Kg
Dimensions (h x l x p)	700 mm x 310mm x 450 mm

2. INSTALLATION AND SAFETY GUIDELINES

READ THE FOLLOWING INSTRUCTIONS CAREFULLY before connecting the discharger to AC mains and battery.

- **Only skilled and by A.T.I.B. Elettronica authorized personnel shall be allowed to open the DDL 150 discharger or carry out any service on it.**
- Before starting the discharger DDL 150 the insulation of power cord and charging cable has to be checked.
- Disconnect from AC mains before connecting or disconnecting the battery or the discharger.

WARNING! While being charged batteries usually produce explosive gases. It is therefore highly recommended:
 a) **Not to smoke in the discharger whereabouts and to keep any flames or sparks away from it.**
 b) **Cyclic tests must not be performed on battery, unless battery is installed in a well ventilated site, where no gas saturation may occur.**

WARNING! The DDL150 discharger site must be chosen carefully, considering that the device contains electrical components, which produce voltaic arcs. The discharger must not be exposed to rain or splashed with water. It must be firmly positioned on flat and solid floors and far from dusty environments and any heating sources. The DDL150 discharger must not be positioned onto supports and / or shelves made of wood or other inflammable materials. The device position should also promote the thermal exchange between the discharger and the environment which ensures device reliability. A minimum of 1m of free space has to be maintained from its front and rear sides (come mensole di legno).

WARNING! Ensure that an adequate earth connection is made to prevent risks of electrocution. Check the rating plate to ensure that the AC input supply corresponds to the discharger parameters given on the rating plate. The AC input supply has to feature a protective device (fuse or automatic cut-out) complying with European Standards. The rating of the protection fuse or cut-out must be at least 10% higher than the consumed power of the discharger, as indicated on its rating plate.

WARNING! While operating, the rear surface of the discharger DDL 150 can reach very high temperatures. Avoid touching the discharger surface without proper heating protection and always keep a free space of at least 1 m from the device.
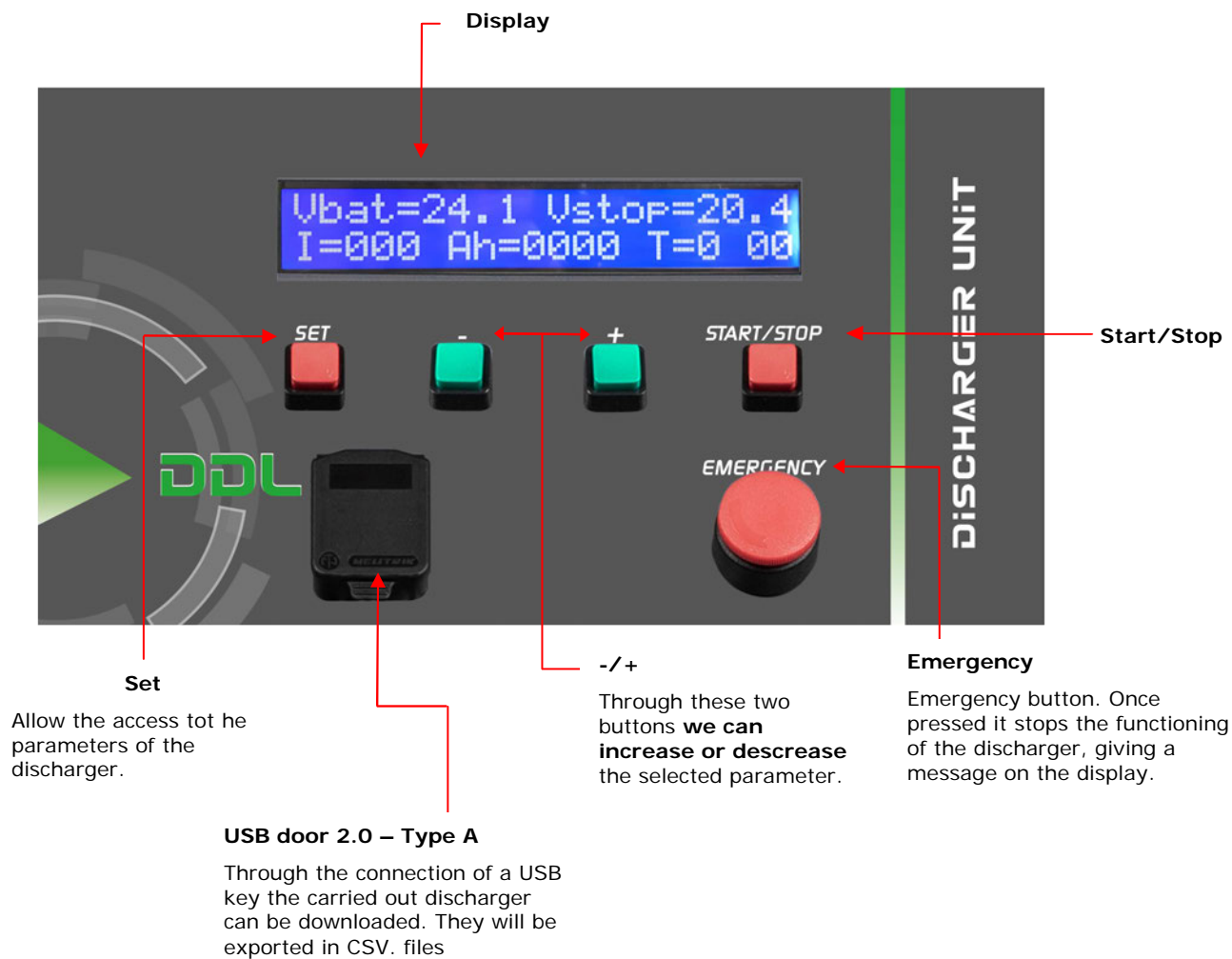
The A.T.I.B. Elettronica S.r.l. discharger doesn't need any particular maintenance, apart from the standard cleaning operations to carry out regularly and periodically according to the working environment. Before starting the discharger cleaning be sure to disconnect the AC Mains and the battery cables.

2.1   Connection Procedures

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1.   Connect the AC mains cable to an AC mains plug.
2.   Connect the battery cable to the battery paying attention to the correct polarity (The battery cable is supplied
        without battery plug)
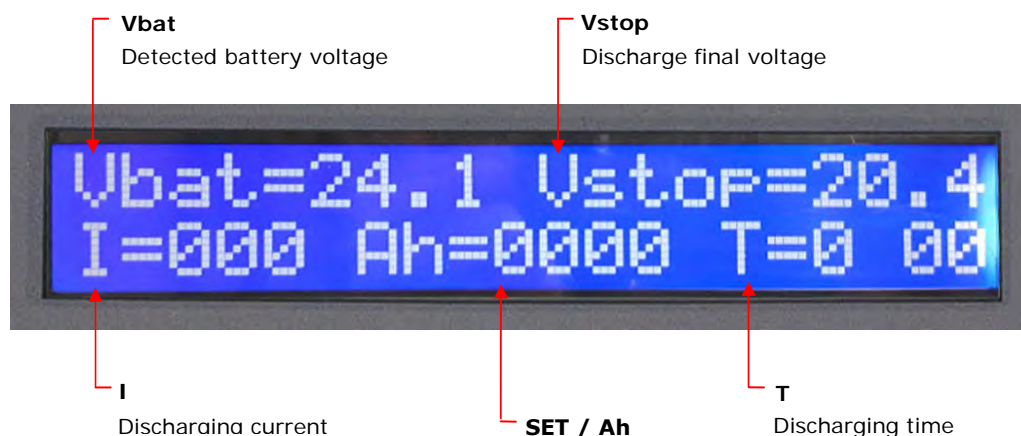3.   Turn on the main switch on the cabinet front side.

3. BUTTONS E DISPLAY

3.1   Buttons

Display

```
Vbat=24.1 Vstop=20.4
I=000 Ah=0000 T=0 00
```

SET   -   +   START/STOP   **Start/Stop**

DDL

EMERGENCY

DiSCHARGER UNiT

-/+

Through these two buttons **we can increase or descrease** the selected parameter.

Emergency

Emergency button. Once pressed it stops the functioning of the discharger, giving a message on the display.

Set

Allow the access tot he parameters of the discharger.

USB door 2.0 – Type A

Through the connection of a USB key the carried out discharger can be downloaded. They will be exported in CSV. files

NOTE
If during a discharge the "START/STOP" button or the "EMERGENCY" button are pressed, the discharger will stop.
In case of "START/STOP" button pressing, after a second the discharger will restart the cycle from the point where it stopped.
In case of "EMERGENCY" button pressing, the discharger will not restart the cycle from the point where it stopped. When the "EMERGENCY" button has been re-enabled, the discharger can restart the cycle only pressing the "START/STOP" button.

3.2   Display

Vbat
Detected battery voltage

Vstop
Discharge final voltage

I
Discharging current

SET / Ah

T
Discharging time

3.3   Time Setting and Visualization

The discharging time can be set with a value between 0 and 99 hours and 50 minutes. According to the time you set, we will have different visualizations:
-    Below 10 hours   - "**9:59**" - 9 h and 59 m
-    Below 100 hours - "**99:0**" - 99 h
If time has been set " **0:00**", the discharge will go on up to infinity until other conditions will occur (see **6** - **End of a Discharging Cycle**).
The maximum fixed discharging time is 999 hours.

As for the duration of a discharging cycle, the time shown is comprised between 0 and 999 hours. According to the time elapsed, we will have different visualizations:
-    Below 10 hours   - "**9:59**" - 9 h and 59 m
-    Below 100 hours - "**99:0**" - 99 h
-    Below 1000 hours - "**999:**" - 999 h

4.   MENU

To have access to the discharging parameters setting, press the button "SET".
Once entered in the menu as the writing "**SET**" appears, the parameter "**T**" corresponds to the time set for the discharge. On the contrary as the writing "**Ah=0000**" appears the value visualized by the parameter "**T**" corresponds to the time detected during the last discharge.
    When the user entered in the menu, through the button "SET" he can choose among three parameters, which are:

I - **Instantaneous Discharging Current**
It represents the current value with which we want to discharge the battery

T - **Discharging Time**
This parameter has two possible functions:

The first function will work leaving the parameters with default value "00:00": the discharger in this case will detect the time of the carried out discharging cycle and the discharge will end when the discharger will reach the "Vstop" value (see below).

The second function will work setting a specific value: in this case the discharger will start its discharge for the time you set until the fixed value (Vstop) will be reached. If the end of discharge voltage will be reached in a shorter spam of time, the discharge process will end without considering the discharging time (T) left.

If the discharger end its discharge because it reached the fixed "Vstop, on the first line of the display the parameter "Vstop" will flash, while on the second line the writing "SET" and the value of the discharged Ah will appear alternatively. During this alternation the value shown by the parameter "T" will correspond to the time set for the discharge (when "SET" is visualized) or to the actual discharging time (when the discharged Ah are visualized).

If the discharger end its discharge because it reached the time set by the user, no parameter will flash and on the second line the writing "SET" and the value of the discharged Ah will appear alternatively.
During this alternation the value shown by the parameter "T" will correspond to the actual discharging time.

Vstop – End of Discharge Voltage

It is the battery voltage value at which the discharger will end its discharge cycle. When the battery reaches the set value, the discharger will end its cycle even through the discharge time "T" hasn't elapsed completely. More precisely, during the discharge cycle parameter "Vstop" has priority on parameter "T".
There is also an other parameter shown on the display but not settable: it is the parameter **"Vbat"**, the battery voltage detected by the discharger.

5. USB

5.1	Sampling Functioning

The discharger memorizes the carried out discharges using an internal not volatile memory that can save 85 discharges, each of them comprised of 1216 samples.
The sampling time is calculated automatically according to the maximum time (T) the user set to carry out the discharge.
If the time value is 0, the discharger will detect one sample every 180 seconds (that allows us to memorize a discharge of about 61 h).
If the time value is different from 0, the sampling time is fixed according to the following formula: Fixed time, in second / (1216 * 0,8)
If the sampling time is less than 2 seconds, then the sampling time is fixed at 2 seconds.

During the normal functioning, when the saved discharges are more than the number memorisable (85), the oldest discharge will be overwritten by the new one.

5.2	Data Downloading

To download the discharges from the USB key, it is simply necessary to insert the USB key in the related door positioned next to the display. The downloading sequence will start automatically as below:

1. The display visualizes:

> **USB key inserted**
> **start transfer**

2. If there are file to download, the display visualizes:

> **USB, key inserted**
> **Trans. N discharge**

   N represents the progressive number (starting from 1) of the discharge in the downloading phase

3. When there are no more discharges to download, the display visualizes:

> **USB, key inserted**
> **Trans. N discharge**

   N represents the number of the discharges transferred.

4. At this point the data download ends and the display will continue to visualize what was visualizing before the key entry.

 When the user disconnects USB key, the display visualizes:

> **USB key removed.**

Finally, the display returns to visualize what was visualizing before the key entry.
The USB key can be left entered permanently in its door; in this way the discharge data are saved at the same time by the internal memory of the discharger and by the USB key itself following the procedures explained before.

The USB management and the discharges downloading can be carried out under one of the following functioning conditions:
- With disconnected battery.
- With connected battery, but not during the charge
- Without any alarm.

5.2	Files And Directories Management in the USB Key

The discharger saves on the key one single file for each single discharge. The name of the file corresponds to an hexadecimal number (8 figures) that indicates in a compressed format date and hour of the beginning of the discharge following by the ".csv" file extension (e.g. 292ECA84.CSV.) Since the name of the file contains information of date and hour with a resolution of 1 second, two discharges with the same name cannot exist. This name uniqueness is used by the discharger to know which data are concretely on the key to not transfer them unnecessarily (if the key is entered afterwards, the files already saved on will not download again).

When the discharging data have been transferred on the key, the copy saved on the discharger internal memory is not deleted and remains always available for following downloads.

All files are saved automatically by the discharger in a directory in the key root; the directory name is D_123456, where 123456 represents the discharger serial number.

If the directory is already present on the key, the discharger simply enters the new files in the same directory; if in the same directory other files are present, the discharger ignores them and do not modify or delete them.

6. END OF A DISCHARGING CYCLE

The discharge cycle ends or is interrupted under one of the following conditions:
- The user interrupts the cycle with the button "START/STOP".
- The user interrupts the cycle with the button "EMERGENCY".
- The battery is not connected anymore
- The temperature thresholds have been reached
- Thermal probe intervention
- The battery voltage is lower than the threshold the user have set
- The time elapsed from the beginning of the discharge is more than the time the user have set
- The time elapsed is more than 999 hours (if time you have set is "**T=0:00**").
- The accumulated capacity is more than 9999Ah

If the cycle is interrupted, it is possible it will restart automatically when the condition which has caused its interruption is not present anymore (e.g. return of an overtemperature alarm).

> **NOTE**
> **To delete the data of the discharged Ah or of the discharging time the user has to turn off the discharger or disconnect the battery.**

APPENDIX A – DISCHARGING CURRENT LIMITS

Due to the connection cables and internal resistance, with battery voltages lower than 12V the maximum dischargeable current is limited according to the following table:

Battery voltage	Maximum current setting	Maximum discharged current	Notes
1-5V	30A	30A	Battery voltage >=2V
6V	120	100A	
5,1V-10,2V	120A	120A	Battery voltage >=8V
10,2V-96V	150A	150A	

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