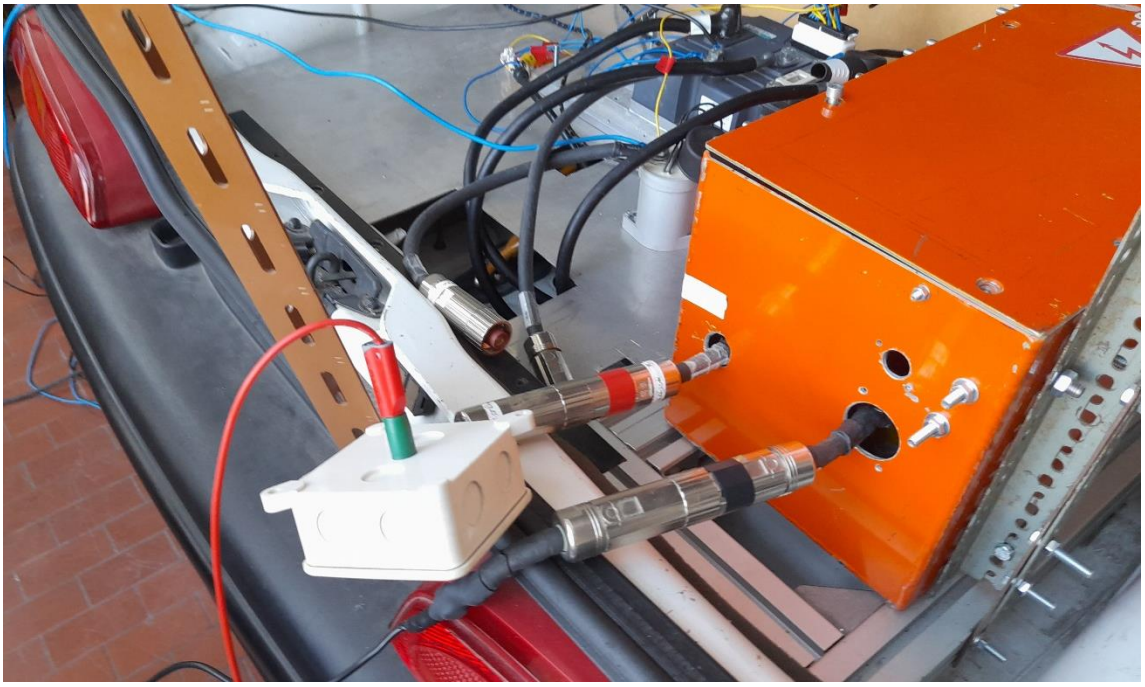
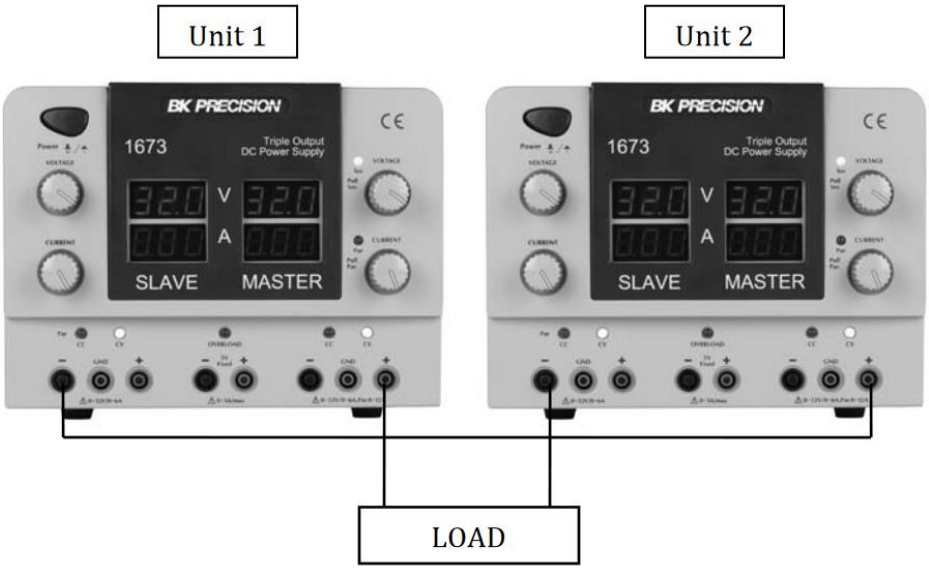
Procedure:

Charging Main Battery

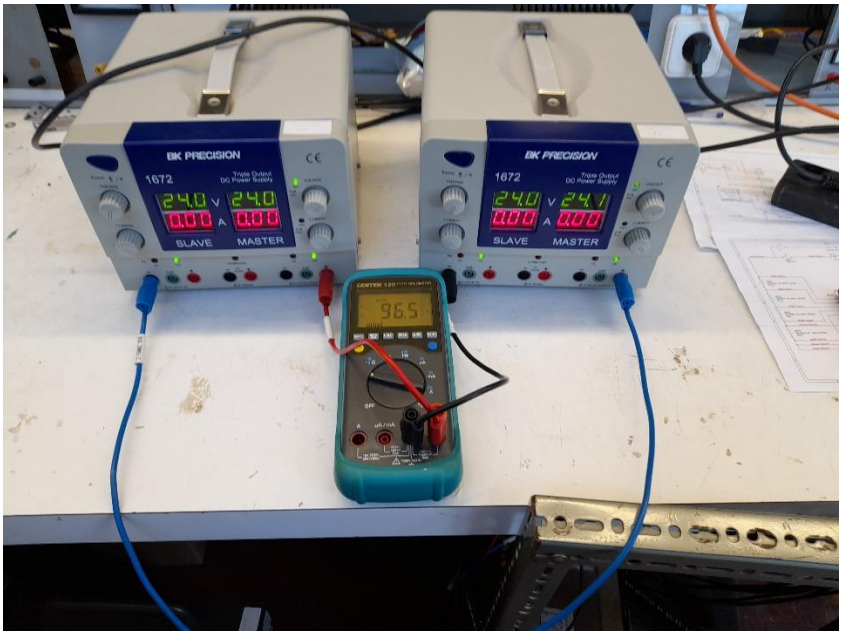
1. **Turn off the BMS**
   Make sure the “4 piscas” is in the up position
2. **Open the rear door of the car**
3. **Disconnect the battery from the inverter**
   Unscrew the connectors
4. **Screw the changing connectors to the battery terminals**



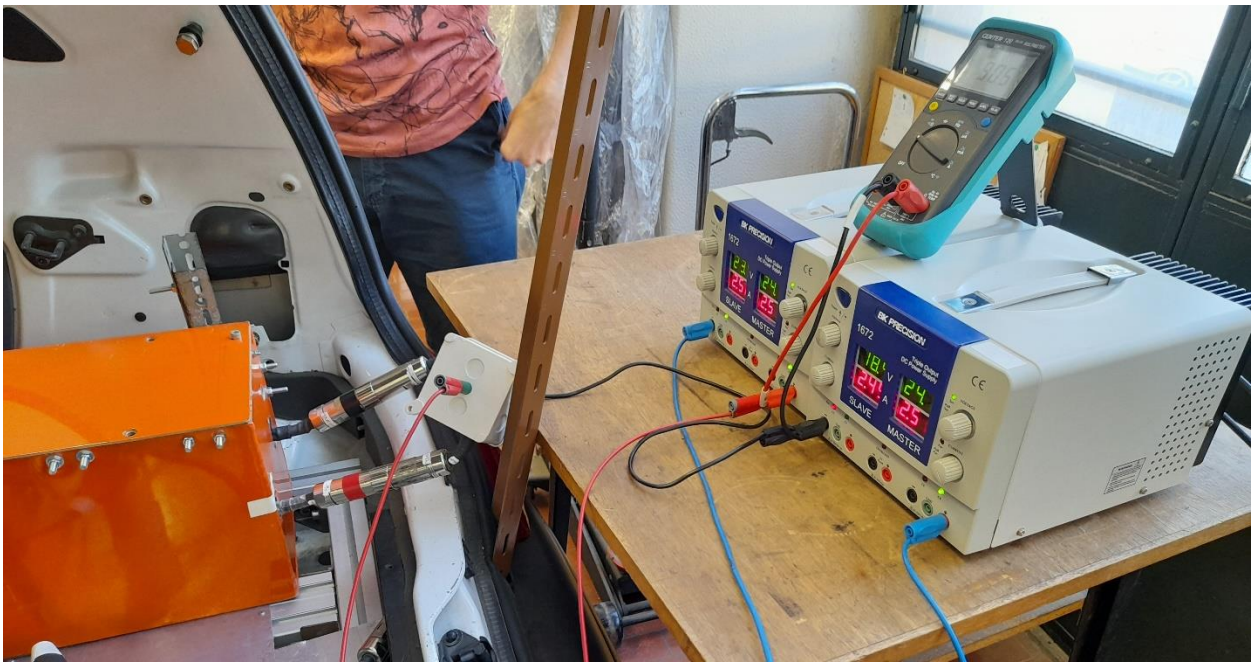
5. **Place a table next to the rear of the car**
6. **Place 2 Bk precision sources on the table and connect them to a wall outlet**
7. **Connect the two Bk precision source in series**
   Do it according to the diagram bellow
   Do not connect the load yet
   In place of the load connect a multimeter



8. **Place all the current knobs on maximum current**
9. **Set the voltage to 96V**
   The master voltage knob of each source should be pulled (series)
   Each voltage display on each source should read 24V
   The multimeter should read 96V
   The setup should be similar to the one bellow



10. **Turn all current knobs to zero**
    This forces the current to be zero
11. **Connect the sources to the battery terminals**
    The setup should now be similar the one on the image bellow



12. Turn on the BMS and place it in "normal" state

i) Turn on the multimeter:

The multimeter is on the car dashboard and reads the voltage of one of the cells of the auxiliar battery. It must be set to measure DC voltage.

ii) **If the multimeter reads above 3.800V turn on the auxiliar system**:

This is done by pressing the "4 piscas" button located in the center console near the parking brake.

If the multimeter reads bellow 3.800V the auxiliar battery must be charged.

iii) Connect a PC to the VIENA network

After the "4 piscas" button is pressed it will take two or three minutes for the "VIENA" network to appear in the list of available networks.

Name: VIENA

Password: not shown because this is a public document

iv) Connect to the user interface

Open the browser and type in: http://192.168.31.50/

Press the "connect" button in the interface

Open the tab named "battery" in the interface

Wait until the values of voltage, soc, temperature and current are displayed

v) Change the state

Press the “change state” button to change the state from “standby” to “normal”
The contactor should be eared closing
The battery is now connected to the sources
Note: if the state is “error” the BMS will not go into “normal”

13. Turn all the current knobs on the bk precision sources to maximum current

The battery is now charging

Note: throughout the operation of the system the cells of the auxiliar battery must not go below 3.8V. Attention must be paid to the value on the multimeter. The system must be shut down when the auxiliar battery reaches bellow 3.8V.

14. When one of the cells reaches the voltage limits stop the changing

Press the “change state” button to change the state from “normal” to “standby”. Thus, disconnecting the battery from the sources and stopping the charging.

It should be noted that if the charging is not stopped there is no problem, the BMS will automatically stop the charging if any cell reaches its voltage limits. However, in this situation the BMS enters “error state” (because one of the cells is above the limit) and will not exit this state until the cell is discharged. This is a bug that I have not solved yet.
(If this happens connect a resistance to the overvoltage cell to discharge and the error will disappear once the BMS is restarted)