



# "HF9"

Three-phase version,  
Ranges 3x208-240Vac, 3x400±10%Vac, 3x480±10%Vac  
PBM205 control card



- TECHNICAL MANUAL -



Before connecting the battery charger to the power supply and the battery,  
**CAREFULLY READ THE INSTRUCTIONS BELOW.**



**CAUTION!** This is a product that complies with **EMC A Class** as established by the CEI EN 61000-6-2 and CEI EN 61000-6-4 standards, that is for **INDUSTRIAL ENVIRONMENTS**



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**ATTENTION**

The **USB** port is a service port to be used only for programming the charging parameters and downloading of historical data and graphs.

You must **disconnect the charger from USB cable during charging**, to prevent EMI noise from interfere with the charging process with unpredictable consequences for the battery charger and battery.

# "HF9" High-Frequency Battery Charger

## 1) USE AND OPERATION

To use this battery charger you must comply with safety requirements contained in laws and regulations and in the provisions set out by the local authorities.

**Obligations of the "user"** : based on these user instructions the "user" is any natural or legal person that uses the P.B.M. S.r.l. charging equipment directly or the person using it on the half of said person. For special cases, eg. leasing, rental, the "user" is the person who, under the arrangements agreed between the owner and the user of P.B.M. S.r.l. charging equipments, takes on the obligations below.

The "user" will be responsible for the site where the appliance is used. He or she must check if the influence of the battery charger interferes with particularly sensitive equipment. The place of use must be chosen so that using the equipment (high direct currents generate interfering magnetic fields) does not adversely affect the operation of electromagnetic devices and magnetic data supports (such as pacemakers, monitors, discs and magnetic disks, magnetic tapes, magnetic cards, watches, etc).

The "user" should make sure that the use of P.B.M. S.r.l. charging equipment complies with current regulations and that any action that may endanger the life and health of the user or any third party is avoided, as well as avoiding any damage to property.

The "user" must make sure that users and operators have read and understood these instructions and comply with safety regulations, safety standards from a technical point of view and use and maintenance provisions.

## 2) INSTALLATION AND SAFETY WARNINGS

Before connecting the battery charger to the power supply and the battery, **CAREFULLY READ THE INSTRUCTIONS BELOW.**

- **FOR CORRECT FUNCTIONING AND IMPROVED YIELD, THE BATTERY CHARGER MUST BE POSITIONED ON THE WALL IN THE CORRECT DIRECTION AND FIXED WITH PLUGS THROUGH THE RELATIVE SLOTS; PAY ATTENTION NOT TO OBSTRUCT THE VENTILATION SLOTS HOLES.**
- Only specialised and authorised staff can carry out jobs that require the battery charger to be opened.
- Before operating the battery charger, the insulation of mains connection cables and of the battery connectors must be verified.
- It is necessary to intervene on electrical equipment, thoroughly trained personnel only.
- Disconnect the mains connection before connecting or disconnecting the battery.
- **CAUTION !!** The battery being charged generates explosive gases, therefore it is prohibited to smoke in proximity of the machinery; avoid naked flames and or sparks and proximity with other machinery that lead to hazardous circumstances for people or property.
- This battery charger contains electrical components which can generate electric arcs and sparks, so if used in enclosed areas it must be positioned in a site suitable to its function; anyhow the standard battery charger (IP 20) must be used in enclosed and well ventilated areas and not exposed to rain and/or splashing water, placed on sound, levels floors. Dusty areas or areas with water sources, sources of heat and humidity should be particularly avoided. **DO NOT** place the battery charger on surfaces and/or shelves made with wood or other flammable materials or accumulate various materials near the battery charger and place any items or containers with liquids on the lid.
- To prevent dangers of electrocution, the battery charger **must be connected to a current socket connected to earth**. Moreover, the current socket to which the battery charger will be connected must be proportionate to the power of the same and must be protected by appropriate electric equipment in compliance with Standards (fuses automatic switch). For sufficient selectivity, the protection must have calibration of at least 10 % over the equipment current absorption. Moreover the appliance must be protected regarding contact voltage that is too high, in compliance with the provisions envisioned by Local Authorities.
- Always use special bipolar connectors.
- **DO NOT** use additional cables to extend the existing electrical connections.
- The P.B.M. S.r.l. charging appliance is maintenance-free, except for routine cleaning that must be performed regularly and periodically according to the type of work environment. Before starting to clean the appliance, disconnect the power supply cable from the mains and the connection cables to the battery.

### 3) CONNECTION TO POWER SUPPLY

It is essential to connect to a current socket proportioned to the power of the installed battery charger.

Ensure to also correctly connect the **earth conductor**.

It is good practice during installation (or successively if the battery charger is moved), **to check the mains voltage** and the presence of all 3 phases present on the position where the battery charger works.

For the **230Vac range** (208-240Vac) the rating of chargers is as follows:

Battery Voltage	Charger Current	Module Power	Active Input POWER	INPUT Iac Nom	FuseAC	DC Fuse Code
V	A	KW	kW	A	A	
24	50	3KW	1,64	4,54	6	URGS 17/ 63
24	60	3KW	1,96	5,45	8	URGS 17/ 80
24	70	3KW	2,29	6,36	8	URZ 17/ 100
24	80	3KW	2,62	7,26	10	URZ 17/ 100
24	100	3KW	3,27	9,08	12	URZ 17/ 125
24	120	6KW	3,93	10,90	16	URZ 17/ 150
24	140	6KW	4,58	12,71	16	URZ 17/180
24	160	6KW	5,24	14,53	20	LMT200
24	180	6KW	5,89	16,34	20	LMT250
24	200	6KW	6,55	18,16	25	LMT250
36	50	3KW	2,40	6,66	8	URGS 17/ 80
36	60	3KW	2,88	7,99	10	URGS 17/ 80
36	70	6KW	3,36	9,32	12	URZ 17/ 100
36	80	6KW	3,84	10,65	16	URZ 17/ 100
36	100	6KW	4,80	13,32	16	URZ 17/ 125
36	120	6KW	5,76	15,98	20	URZ 17/ 150
36	130	6KW	6,24	17,31	25	URZ 17/160
36	140	9KW	6,72	18,64	25	URZ 17/180
36	160	9KW	7,68	21,31	32	LMT200
48	30	3KW	1,92	5,33	8	URGS 17/ 50
48	40	3KW	2,56	7,10	10	URGS 17/ 50
48	50	3KW	3,20	8,88	12	URGS 17/ 63
48	60	6KW	3,84	10,65	16	URGS 17/ 80
48	70	6KW	4,48	12,43	16	URZ 17/ 100
48	80	6KW	5,12	14,21	20	URZ 17/ 100
48	90	6KW	5,76	15,98	20	URZ 17/ 125
48	100	6KW	6,26	17,37	25	URZ 17/ 125
48	110	9KW	6,89	19,11	25	URZ 17/ 150
48	120	9KW	7,51	20,84	25	URZ 17/ 150
48	140	9KW	8,77	24,32	32	URZ 17/180
48	150	9KW	9,19	26,06	32	URZ 17/180
80	40	6KW	4,09	11,33	16	URGS 17/ 50
80	50	6KW	5,11	14,17	20	URGS 17/ 63
80	60	6KW	6,13	17,00	20	URGS 17/ 80
80	70	9KW	7,15	19,83	25	URZ 17/ 100
80	80	9KW	8,17	22,67	32	URZ 17/ 100
80	90	9KW	9,19	25,50	32	URZ 17/ 125
96	40	6KW	4,90	13,60	16	URGS 17/ 50
96	50	6KW	6,13	17,00	20	URGS 17/ 63
96	60	9KW	7,35	20,40	25	URGS 17/ 80
96	75	9KW	9,19	25,50	32	URZ 17/ 100

Table 1 : ratings for the 230Vac range (208-240Vac)



For the 400Vac range the rating of chargers is as follows

Battery Voltage	Charger Current	Module Power	Active Input POWER	INPUT Iac Nom	FuseAC	DC Fuse Code
V	A	KW	kW	A	A	
24	50	3KW	1,64	2,61	4	URGS 17/ 63
24	60	3KW	1,96	3,13	4	URGS 17/ 80
24	70	3KW	2,29	3,65	6	URZ 17/ 100
24	80	3KW	2,62	4,18	6	URZ 17/ 100
24	100	3KW	3,27	5,22	8	URZ 17/ 125
24	120	6KW	3,93	6,27	8	URZ 17/ 150
24	140	6KW	4,58	7,31	10	URZ 17/180
24	160	6KW	5,24	8,35	10	LMT200
24	180	6KW	5,89	9,40	12	LMT250
24	200	6KW	6,55	10,44	16	LMT250
24	220	9KW	7,20	11,49	16	LMT315
24	240	9KW	7,85	12,53	16	LMT315
36	50	3KW	2,40	3,83	6	URGS 17/ 63
36	60	3KW	2,88	4,59	6	URGS 17/ 80
36	70	6KW	3,36	5,36	8	URZ 17/ 100
36	80	6KW	3,84	6,13	8	URZ 17/ 100
36	100	6KW	4,80	7,66	10	URZ 17/ 125
36	120	6KW	5,76	9,19	12	URZ 17/ 150
36	130	6KW	6,24	9,95	12	URZ 17/160
36	140	9KW	6,72	10,72	16	URZ 17/180
36	160	9KW	7,68	12,25	16	LMT200
36	180	9KW	8,64	13,78	20	LMT250
36	200	9KW	9,60	15,31	20	LMT250
36	220	12KW	10,56	16,85	20	LMT315
36	240	12KW	11,52	18,38	25	LMT315
36	250	12KW	12,48	19,14	25	LMT315
48	30	3KW	1,92	3,06	4	URGS 17/ 50
48	40	3KW	2,56	4,08	6	URGS 17/ 50
48	50	3KW	3,20	5,10	6	URGS 17/ 63
48	60	6KW	3,84	6,13	8	URGS 17/ 80
48	70	6KW	4,48	7,15	10	URZ 17/ 100
48	80	6KW	5,12	8,17	10	URZ 17/ 100
48	90	6KW	5,76	9,19	12	URZ 17/ 125
48	100	6KW	6,26	9,99	12	URZ 17/ 125
48	110	9KW	6,89	10,99	16	URZ 17/ 150
48	120	9KW	7,51	11,99	16	URZ 17/ 150
48	140	9KW	8,77	13,98	20	URZ 17/180
48	150	9KW	9,19	14,98	20	URZ 17/180
48	160	12KW	9,80	15,98	20	LMT200
48	180	12KW	11,03	17,98	25	LMT250
48	200	12KW	12,26	19,98	25	LMT250
48	220	16KW	13,48	21,97	32	LMT315
48	240	16KW	14,71	23,97	32	LMT315
48	250	16KW	15,32	24,97	32	LMT315
80	40	6KW	4,09	6,52	8	URGS 17/ 50
80	50	6KW	5,11	8,15	10	URGS 17/ 63
80	60	6KW	6,13	9,78	12	URGS 17/ 80
80	70	9KW	7,15	11,40	16	URZ 17/ 100
80	80	9KW	8,17	13,03	16	URZ 17/ 100
80	90	9KW	9,19	14,66	20	URZ 17/ 125
80	100	12KW	10,21	16,29	20	LTM160
80	120	12KW	12,26	19,55	25	LTM160
80	140	16KW	14,30	22,81	32	LMT200



80	160	16KW	16,34	26,07	32	LMT200
96	40	6KW	4,90	7,82	10	URGS 17/ 50
96	50	6KW	6,13	9,78	12	URGS 17/ 63
96	60	9KW	7,35	11,73	16	URGS 17/ 80
96	75	9KW	9,19	14,66	20	URZ 17/ 100
96	80	12KW	9,80	15,64	20	LTM160
96	100	12KW	12,26	19,55	25	LTM160
96	120	16KW	14,71	23,46	32	LTM160

Table 2 : ratings for the 400Vac range

For the 480Vac range the rating of chargers is as follows:

Battery Voltage	Charger Current	Module Power	Active Input POWER	INPUT Iac Nom	FuseAC	DC Fuse
V	A	KW	kW	A	A	Code
24	50	3KW	1,64	2,18	4	URGS 17/ 63
24	60	3KW	1,96	2,61	4	URGS 17/ 80
24	70	3KW	2,29	3,05	4	URZ 17/ 100
24	80	3KW	2,62	3,48	6	URZ 17/ 100
24	100	3KW	3,27	4,35	6	URZ 17/ 125
24	120	6KW	3,93	5,22	8	URZ 17/ 150
24	140	6KW	4,58	6,09	8	URZ 17/180
24	160	6KW	5,24	6,96	10	LMT200
24	180	6KW	5,89	7,83	10	LMT250
24	200	6KW	6,55	8,70	12	LMT250
24	220	9KW	7,20	9,57	12	LMT315
24	240	9KW	7,85	10,44	15	LMT315
36	50	3KW	2,40	3,19	4	URGS 17/ 63
36	60	3KW	2,88	3,83	6	URGS 17/ 80
36	70	6KW	3,36	4,47	6	URZ 17/ 100
36	80	6KW	3,84	5,10	6	URZ 17/ 100
36	100	6KW	4,80	6,38	8	URZ 17/ 125
36	120	6KW	5,76	7,66	10	URZ 17/ 150
36	130	6KW	6,24	8,30	10	URZ 17/160
36	140	9KW	6,72	8,93	12	URZ 17/180
36	160	9KW	7,68	10,21	12	LMT200
36	180	9KW	8,64	11,49	15	LMT250
36	200	9KW	9,60	12,76	20	LMT250
36	220	12KW-48	10,56	14,04	20	LMT315
36	240	12KW-48	11,52	15,31	20	LMT315
36	250	12KW-48	12,48	15,95	20	LMT355
48	30	3KW	1,92	2,55	4	URGS 17/ 50
48	40	3KW	2,56	3,40	4	URGS 17/ 50
48	50	3KW	3,20	4,25	6	URGS 17/ 63
48	60	6KW	3,84	5,10	6	URGS 17/ 80
48	70	6KW	4,48	5,96	8	URZ 17/ 100
48	80	6KW	5,12	6,81	8	URZ 17/ 100
48	90	6KW	5,76	7,66	10	URZ 17/ 125
48	100	6KW	6,26	8,32	10	URZ 17/ 125
48	110	9KW	6,89	9,16	12	URZ 17/ 150
48	120	9KW	7,51	9,99	12	URZ 17/ 150
48	140	9KW	8,77	11,65	15	URZ 17/180
48	150	9KW	9,19	12,49	15	URZ 17/180
48	160	12KW-48	9,80	13,32	20	LMT200
48	180	12KW-48	11,03	14,98	20	LMT250
48	200	12KW-48	12,26	16,65	20	LMT250
48	220	16KW	13,48	18,31	25	LMT315
48	240	16KW	14,71	19,98	25	LMT315



48	250	16KW	15,32	20,81	25	LMT315
72	40	6KW	3,68	4,89	6	URGS 17/ 50
72	50	6KW	4,60	6,11	8	URGS 17/ 63
72	60	6KW	5,51	7,33	10	URGS 17/ 80
72	70	9KW	6,43	8,55	12	URZ 17/ 100
72	80	9KW	7,35	9,78	12	URZ 17/ 100
72	100	9KW	9,19	12,00	15	URZ 17/ 125
72	120	12KW-96	11,03	14,66	20	LMT160
72	140	16KW	12,87	17,11	25	LMT200
72	160	16KW	14,71	19,55	25	LMT200
80	40	6KW	4,09	5,43	8	URGS 17/ 50
80	50	6KW	5,11	6,79	8	URGS 17/ 63
80	60	6KW	6,13	8,15	10	URGS 17/ 80
80	70	9KW	7,15	9,50	12	URZ 17/ 100
80	80	9KW	8,17	10,86	15	URZ 17/ 100
80	90	9KW	9,19	12,22	15	URZ 17/ 125
80	100	12KW-96	10,21	13,58	20	LMT160
80	120	12KW-96	12,26	16,29	20	LMT160
80	140	16KW	14,30	19,01	25	LMT200
80	160	16KW	16,34	21,72	30	LMT200
96	40	6KW	4,90	6,52	8	URGS 17/ 50
96	50	6KW	6,13	8,15	10	URGS 17/ 63
96	60	9KW	7,35	9,78	12	URGS 17/ 80
96	75	9KW	9,19	12,22	15	URZ 17/ 100
96	80	12KW-96	9,80	13,03	20	LMT160
96	100	12KW-96	12,26	16,29	20	LMT160
96	120	16KW	14,71	19,55	25	LMT160

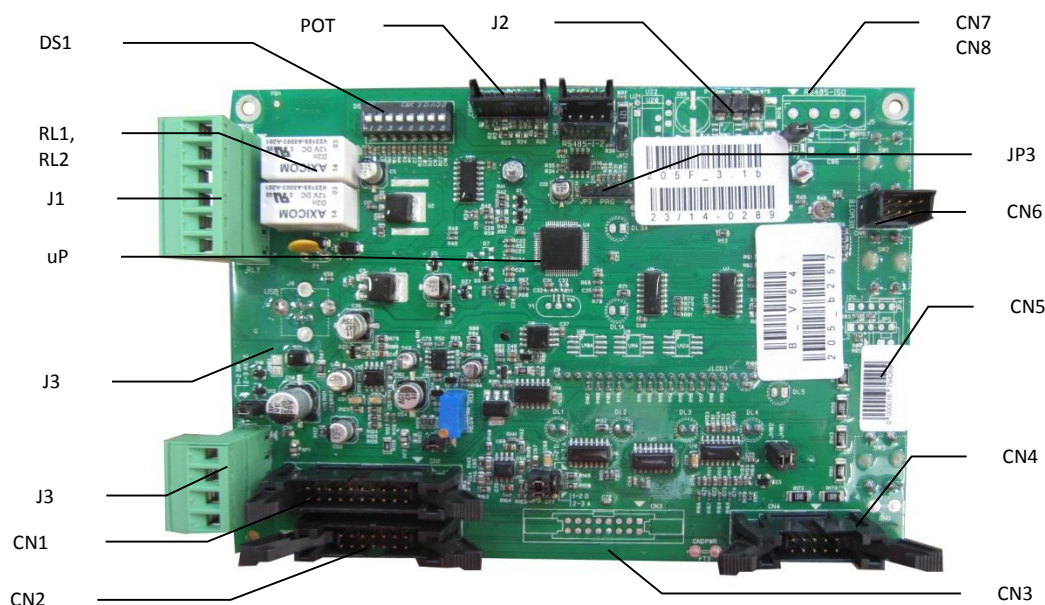
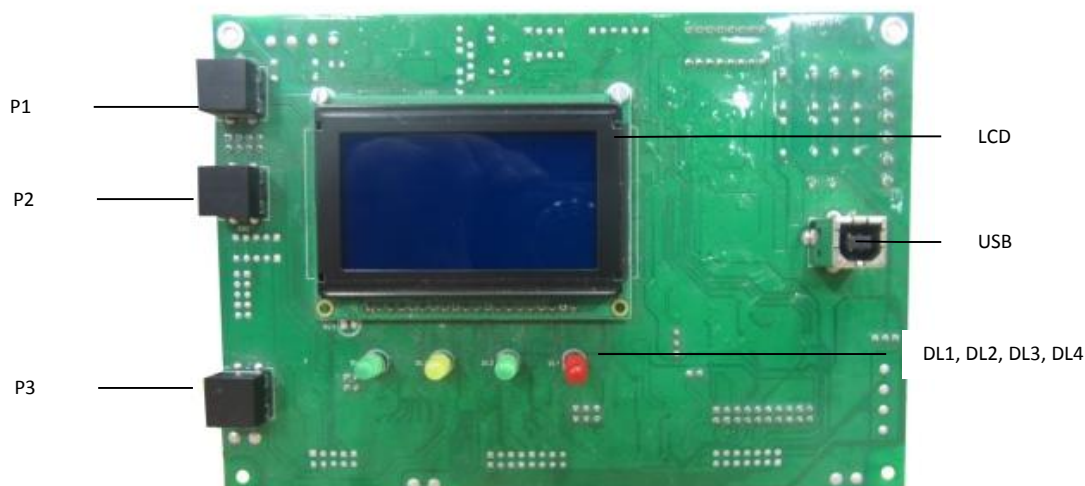
Table 3 : ratings for the 480Vac range

#### 4) BATTERY CONNECTION

It is recommended to use relevant **bi-polar connectors in compliance with Standards** without the possibility of inversion of the polarity on the battery. Also check **the current connection of the cables in the connector contacts**.

This operation has to be performed by skilled personnel only.

5) DESCRIPTION OF THE CONTROL CARD PBM205



Where:

- P1 :** SETUP / UP : it allows to enter the menus, navigate, edit/increase a parameter
- P2 :** PARAMETERS: it allows to view the charging parameters, edit/decrease the parameters
- P3 :** ON/OFF: it allows to interrupt or resume current charging, select a menu, confirm the value of a parameter
- DL4 :** green signalling LED **Battery connected (green)**
- DL3:** yellow signalling LED **Final charge in progress (yellow)**
- DL2:** green signalling LED **End of charging (green)**
- DL1:** red signalling LED **Fault (red)**
- LCD:** multifunctional **graphic display** with liquid crystals
- USB:** **USB** port to read and view charging data in the memory remotely
- uP :** microprocessor
- JP3:** Programming connector of the microcontroller
- J1:** Connector for Relay RL1 and RL2
- CN1 :** 20-way FLAT connector page 8 to transmit the control signals of the power board to





- CN2 :** the CSP203 power board  
14-way FLAT connector to transmit the auxiliary signals of the power board to the CSP203 power board
- CN3, CN4:** FLAT connectors used on other models
- CN5 (JP4,JP5):** Connectors for expansion boards with I2C protocol
- CN7, CN8:** Connectors for internal RS485 serial (to connect more than one CSP205 board in a MASTER/SLAVE configuration)
- J2 :** Connectors for external RS485 serial (to connect the battery charger and the external control system)
- CN6 :** Connector for expansion on LED/Remote buttons panel

## 6) LCD DISPLAY

The LCD display fitted on the PBM205 board is a graphic LCD 64 rows x 128 columns and is used to display up to 8 rows x 20 columns of text characters.

When the board is powered up, the display is fully lit, i.e. there is a white screen during which you can verify the proper functioning of the display. It then displays a window (INFO FW) which features the information reported below:



ROW	EXAMPLE	DESCRIPTION
(1)	FW-BIOS INFO 3.1	HEADING of the Menu
(2)	*** PBM ***	
(3)	*** ALFA PROGETTI ***	
(4)	* [----HF205----]*	Name of the control board
(5)	BIOS:HF205 -V6.4	Version of the BIOS
(6)	Main:b2.26-30.05.2011	Version of the main programme and date of when it was issued

The Screen illustrated below, called (INFO CB) will then appear:



ROW	EXAMPLE	DESCRIPTION
(1)	CB-CONFIG INFO 3.2	HEADING of the Menu
(2)	48V/90A	Size of the battery charger
(3)	IDB=BATT01234567	Name of the connected Battery
(4)	CURVE N.1	Index of the selected charging curve (out of the 8 in the memory)
(5)	C-ID=1PB ST_01.0001	Unique code of the charging curve as assigned by PBM
(6)	HDW = 3=UNIV.-OLD MASTER, NSL=01	Type of controlled Power (in our example a battery charger of the new HF7 generation) in Normal mode (power on a single module and not in Master/Slave configuration)

Then the Main MONITOR page is displayed. This shows the main charging parameters in progress and is illustrated below.



ROW	EXAMPLE	DESCRIPTION
(1)	Pb 1Pb ST 48V /90A	Technology of the Battery, Type of Curve, Size of the battery charger
(2)	54,3 V 74A	Battery voltage and current
(3)	Ah= 0 Tc= 0h 0m 9s	Ah charged, Charging time in hours, min, sec
(4)	PhI1 CHARGE	Current charging phase, STATUS or the battery charger (eg. phase = phase constant current I1, Status= BATTERY IN CHARGE)
(5)	-- Messages	Possible fault messages

By connecting the battery, the battery charger starts the charging phase, during which the battery charger releases current to the battery according to the charging profile (CURVE) selected.

Appendix A describes the curves available in the battery charger, which can be accessed by the user as charging curves.

Each curve has a:

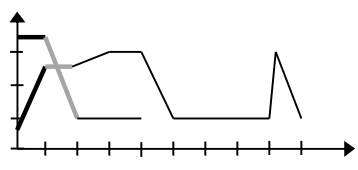
- Number of active Phases
- Presence and Type of Equalisation Phase
- Presence and Type of Maintenance Phase
- Each phase has a:
  - Type of Phase :
    - o I : constant current
    - o U: constant voltage
    - o W: decreasing current
    - o A: stop
  - Output conditions:
    - o Maximum time
    - o A voltage/current threshold is being reached
    - o Other events (eg. switching to an auxiliary input, etc.)
    - o Anomalous conditions

The output condition of each phase identifies:

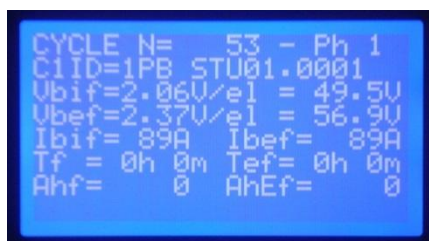
- o The next charging phase to conduct

While the appliance is charging, by pressing the Button P2, it is possible to move from the MONITOR 1 page to the MONITOR 2 page shown below.



ROW	EXAMPLE	DESCRIPTION
(1)	56.0V 89A	Battery Voltage and Current Output
(2)		Active charging profile indicating : <ul style="list-style-type: none"> <li>- Phase completed (Bold line)</li> <li>- Current phase (Flashing line)</li> <li>- Phase to conduct (Thin line)</li> </ul>
(3)	0Ah PhI1 21s	Ah charged, Charging Phase (phase 3 type I = Const Current) Charging time in hours, min, sec
(4)	-- Message	Possible fault Messages

By pressing the P2 button again, the MONITOR 3 page is displayed. This shows detailed information on the charging process as shown below.



ROW	EXAMPLE	DESCRIPTION
(1)	CYCLE N= 53 - Ph 1	Number of charging cycle and current charging phase E.g.: charging cycle 5 and Phase 3
(2)	C1ID=1PB STU01.0001	Unique code of the charging curve
(3)	Vbif=2.06V/el = 49.5V	Battery voltage at the beginning of the phase (Vbif) first expressed as element voltage (V/el) and then as absolute voltage (V)
(4)	Vbef=2.37V/el = 56.9V	Battery voltage at the end of the phase (current phase) (Vbef) first expressed as element voltage (V/el) and then as absolute voltage (V)
(5)	Ibif= 89A Ibef= 89A	Current at the beginning of the phase (Ibif) and current at the end of the phase (Ibef)
(6)	Tf = 0h 0m Tef= 0h 0m	Time of the individual phase (Tf) and Overall charging time at the end of the phase (Tef)
(7)	Ahf= 0 AhEf= 0	Ah output in the selected phase and overall charged Ah
(8)	-- Message	It reports any faults that took place during the charging cycle

## 7) PROCEDURE TO CHANGE THE CURVE PROFILE

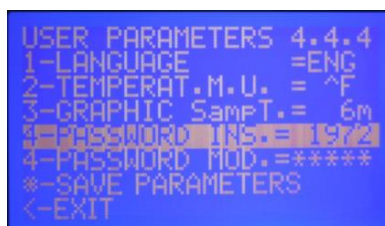
- 1) Power the charger **only through the power supply, without connecting the battery**
- 2) Press the key ArrowUp to enter the **Menu**
- 3) Move using **ArrowUp** or **ArrowDown** until selecting **4>Program** and press ENTER



- 4) Select **1>User Param.** and press ENTER



- 5) Select **4-Ins.Password 1973** and press ENTER



- 6) Move using **ArrowUp** or **ArrowDown** until reaching the value **1973** and press ENTER
- 7) Select **\*-StoreValues** and press ENTER (Verify the blinking of the writing memo which appears after the row \*-Memorizza valori (StoreValues))
- 8) Once verified this, select **<-Exit** and press ENTER
- 9) Select **5>Curve Param.-Fix** and press ENTER



- 10) Select the **first row** (in picture 1-CV5=5IUDESU01.0001) where the number 5 after the letters CV, indicates the curve number (in this instance, then, the curve is the number 5 one)



- 11) Press ENTER and move using **ArrowUp** or **ArrowDown** until selecting the desired charging curve.
- 12) Select **\*-StoreValues** and press ENTER (Verify the blinking of the writing memo which appears after the row \*- StoreValues)
- 13) Once verified this, select **<-Exit** and press ENTER
- 14) Select **<-Main Menu** and press ENTER
- 15) Select **1>Monitor** and press ENTER
- 16) **Verify** that in first top row shows the **curve number** previously selected



- 17) Repeat steps 2 to 8 (included), setting at step 6 a different value from password 1973.
- 18) Verify that only the first row **1>UserParam.** appears
- 19) Select **<-Main Menu** and press ENTER
- 20) Select **1>Monitor** and press ENTER
- 21) Now all you have to do is connect the battery and use the charger with the desired curve.

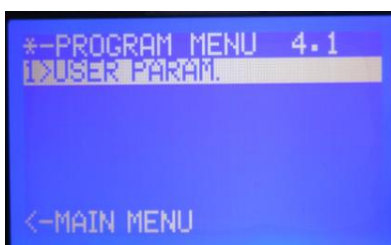
**IT IS STRICTLY FORBIDDEN TO ENTER IN OTHER MENUS AND/OR CHANGE OTHER SETTINGS NOT MENTIONED IN THE FOLLOWING PROCEDURE.**

## 8) PROCEDURE TO CHANGE THE CHARGE CURRENT

- 1) Power the charger **only through the power supply, without connecting the battery**
- 2) Press the key **ArrowUp** to enter the **Menu**
- 3) Move using **ArrowUp** or **ArrowDown** until selecting **4>Program** and press ENTER



- 4) Select **1>UserParam.** and press ENTER



5) Select **4-Password Ins.** and press ENTER

```

USER PARAMETERS 4.4.4
1-LANGUAGE      =ENG
2-TEMPERAT.M.U. = ^F
3-GRAPHIC SampT.= 6m
4-PASSWORD INS.= 1973
4-PASSWORD MOD.=*****
*-SAVE PARAMETERS
<-EXIT
    
```

- 6) Move using **ArrowUp** or **ArrowDown** until reaching the value **1973** and press ENTER
- 7) Select **\*-StoreValues** and press ENTER (Verify the blinking of the writing memo which appears after the row \*-StoreValues)
- 8) Once verified this, select **<-Exit** and press ENTER
- 9) Select **4> Current Param** and press ENTER

```

*-PROGRAM MENU 4.4
1>USER PARAM.
2>HW CONFIGURAT.
3>VOLTAGE PARAM.
4>CURRENT PARAM.
5>CURVE PARAM-FIX
6>CURVE PARAM-PHASE
<-MAIN MENU
    
```

10) Select the **second row 2-Nom. Current = xxxA**

```

CURRENT PARAM. 4.3.2
1-ISHUNT @100mU= 75A
2-NOM. CURRENT = 80A
3-NOM. POWER = 7680W
4-MAX. POWER = 7680W
*-SAVE PARAMETERS
<-EXIT
    
```

- 11) Press ENTER and move using **ArrowUp** or **ArrowDown** until selecting the desired charging current. (in this instance 70A)
- 12) Select **\*-Store Values** and press ENTER (Verify the blinking of the writing memo which appears after the row \*-StoreValues)

```

CURRENT PARAM. 4.3.3
1-ISHUNT @100mU= 75A
2-NOM. CURRENT = 70A
3-NOM. POWER = 6720W
4-MAX. POWER = 7680W
*-SAVE PARAMETERS
<-EXIT
    
```

- 13) Select the row **3-NOM. POWER =xxxxW**
- 14) Press ENTER and move using **ArrowUp** or **ArrowDown** until selecting the battery charger power, calculated using the following formula : **Rated battery Volt : 2 x 2.4V/eI x rated current**  
**Example : 48V : 2 x 2.4 x 70A = 4032W>** confirm with the key ENTER.

**N.B. It is likely that the desired value cannot be selected; if so, select the next desired value.**

- 15) Select **\*-StoreValues** and press ENTER (Verify the blinking of the writing memo which appears after the row **\*-StoreValues**)
- 16) Repeat steps 13, 14 and 15 for the 4 **4-Potenza max (Max Power)** and verify that the power in row 3 is the same as in row 4.
- 17) Once verified this, select **<-Exit** and press ENTER
- 18) Select **<-Main Menu** and press ENTER
- 19) Select **1>Monitor** and press ENTER
- 20) **Verify** that in first top row shows the **current value** previously selected



- 21) Repeat steps 3, 4, 5, 6 and 7, editing in step No. 6 the value of 4-INS.PASSWORD.
- 22) Once verified this, select **<-Exit** and press ENTER, and check that only the row 1>USERPARAM. appears.
- 23) Now all you have to do is connect the battery and use the charger with the desired current.

**IT IS STRICTLY FORBIDDEN TO ENTER IN OTHER MENUS AND/OR CHANGE OTHER SETTINGS NOT MENTIONED IN THE FOLLOWING PROCEDURE.**

## 9) VISUAL SIGNALS

This program illustrates the visual signals on the 4 status LEDs during the various operating statuses of the battery charger.

REF	DESCRIPTION	DL4 LED (green)	DL3 LED (yellow)	DL2 LED (green)	DL1 LED (red)	DISPLAY
S1	Power supply from battery only	OFF	OFF	OFF	OFF	ON
S2	Power supply from mains only	OFF	OFF	OFF	OFF	ON
S3	Power supply from mains and from battery	ON	OFF	OFF	OFF	ON
S4	Autostart execution	BL	BL	BL	BL	ON
F1	Phase 1 – Initial Charge C1	BL	OFF	OFF	OFF	ON
F2-F7	Phase 2 – Phase 7	BL	ON	OFF	OFF	ON
F8	Equaliz. standby	ON	ON	ON	OFF	ON
EQU ON	Equalisation charge ON (in operation)	BL	BL	ON	OFF	ON
EQU OFF	Equalisation charge OFF (in standby)	ON	ON	ON	OFF	ON
M	Maintenance	BL	BL	ON	OFF	ON
END	Charging Ended	ON	ON	ON	OFF	ON

Where:

- OFF = the LED is off
- ON = the LED is permanently on
- BL = the LED flashes (Blink, T=1seconds)
- = the LED can be in any condition

### 10) FAULT CONDITIONS

When the appliances operating there can be two types of fault conditions:

- Blocking Faults (BF)
- NON-Blocking Faults (NBF)

The relative conditions of the LEDs are shown below.

REF	DESCRIPTION	Led DL4 (green)	Led DL3 (yellow)	Led DL2 (green)	Led DL1 (red)	DISPLAY
BF	Blocking Fault	OFF	OFF	OFF	ON	OFF
NBF	NON-Blocking Fault	OFF	OFF	OFF	BLK	OFF

The MONITOR 1 page, which is usually the default page displayed during charging, reports the fault without featuring detailed information, but only the information related to the class of the fault.

Faults are indeed divided into the classes below and, in the event of the fault, the LCD only displays the Class of the fault.

FAULTS CLASSES	DESCRIPTION
SYSTEM FAILURE	Fault related to the operation of the logic board
ANTI OPPORTUNITY CH	Battery Voltage exceeds the Voltage threshold set to recognise an Occasional Charge Condition
SYSTEM MESSAGE	Status message (not a fault message) of the system
COMM FAILURE	Communication error between the CPU and other peripheral systems (USB, RS485)
BATTERY STATUS	Fault related to the operation of the Battery
CHARGER STATUS	Fault condition related to the use of the battery charger
CHARGER FAILURE	Fault related to a malfunctioning or failure of the power part
THERMAL FAILURE	Fault related to the reading of the Temperature of the Battery, as the presence of Temperature probe is set
INT. OVER TEMP.	Fault related to the overtemperature of the power board
FAILURE CURVE	Programme fault in the selected charging profile (eg. Phase timeout or Overall charging timeout)

The exact detail (Code and Description) of the fault is displayed to the user only by entering the MONITOR 2 page or through the SW HFView.

Fault conditions are then divided into various categories according to the effect they have on the charging cycle.

- Information messages to the user (MESSAGE)
- Faults that block the battery charger leading to a reset of the charge and that usually require an intervention of the user or technical support (BLOCK. F)
- Non--blocking faults whose cause may disappear causing the charging process to restart (NON BLOCK. F.)
- Faults that leave the battery charger to conduct attempts to restart. If these are not successful they lead to a Blocking anomaly ( 3T NON BLOC. F)

Here below are the possible "fault" conditions with the related description of the message shown on the LCD and content displayed on the LED.

ID	FAULT	DESCRIPTION	LCD	DL4V	DL3G	DL2V	DL1R
0	STATUS OKAY	No fault	OK	---	---	---	---
1	DEFECTIVE EPROM	faulty EEPROM	MESSAGE	---	---	---	BLK1
2	DEF. I2C LINE 1	I2C-2 line does not respond to the controls	MESSAGE	---	---	---	BLK1
3	DEF. I2C LINE 2	I2C-2 line does not respond to the controls		---	---	---	---
4		Dispo		---	---	---	---
5		Dispo		---	---	---	---





6	EXT-485 COM.ERROR	Comunic. error on external 485 line (J2)	MESSAGE	---	---	---	BLK1
7	INT-485 COM.ERROR	Comunic. error on internal 485 line (CN7-CN8)	MESSAGE	---	---	---	BLK1
8	USB COM.ERROR	Communic. error on USB line	MESSAGE	---	---	---	BLK1
9	ANTIOPP.CH.ACTIVE	Anti-opportunity function active	A.NON BLOC.START	BLK2	BLK2	BLK2	BLK2
10	SLAVE nn NOT RESP	The internal slave unit does not communicate with the master	MESSAGE	---	---	---	BLK1
11		Dispo					
12	CH. STOP due toB	Battery temporarily disconnected	MESSAGE	---	---	---	BLK1
13	BATTERY FUSE	Battery fuse broken	NON BLOCK F.	---	---	---	BLK1
14	TIMEOUT IN CHARG.	Global safety timer intervened	BLOCK.F.		---		ON
15	THERMAL CUT-OFF	Dissipators overtemperature from Therm.Pad	3T NON BLOC. F	---	---	---	BLK1/ON
16	DEF. MAIN VOLTAGE	No power supply from mains	NON BLOCK F.	---	---	---	BLK1
17	CURRENT TOO LOW	Current below the minimum charging level	NON BLOCK F.	---	---	---	---
18	DRIV. DON'T OPEN	Power open (no curr output in on)	MESSAGE	---	---	---	BLK1
19	DRIV. DON'T CLOSE	Power in d.c. (current output too high)	MESSAGE	---	---	---	BLK1
20	BATT.T. SENSOR OC	Tbatt probe open or missing	NON BLOCK F.	---	---	---	BLK1
21	BATT.T. SENSOR SC	Tbatt probe in d.c.	NON BLOCK F.	---	---	---	BLK1
22	BATT.T. TOO HIGH	Battery temperature over the limit	NON BLOCK F.	---	---	---	BLK1
23		Dispo					
24		Dispo					
25		Dispo					
26		Dispo					
27		Dispo					
28	PARAM. NOT READ	BASE or CURVE parameters not read by EEPROM	BLOCK.F.	---	---	---	ON
29	CURVES NOT READ	Dispo					
30	EEPROM INITIALIS.	EEPROM parameters initialised (before the board is powered on)	MESSAGE	---	---	---	---
31	COND. 1 - PHASE X	Condit. 1 – phase xx	PRG.F.	---	---	---	BLK1/ON
32	COND. 2 - PHASE X	Condit. 2 – phase xx	PRG.F.	---	---	---	BLK1/ON
33		Dispo					
34		Dispo					
35	PFC FAULT	The PFC section is not operating correctly	MESSAGE	---	---	---	BLK1
36		Dispo					
37		dispo					
38		dispo					
39		dispo					
40	MASTER NON COM.nn	The master does not communicate with the nn slave module	MESSAGE	---	---	---	BLK1

Where:

MESSAGE : Status condition that only sends a Message on the LCD  
 NON BLOCK.F.START : STOP condition only before START  
 NON BLOCK F. : STOP condition with limited number of returns  
 3T NON BLOCK F: STOP condition with 3 returns, followed by final BLOCK  
 BLOCK.F. : Immediate final BLOCK  
 PRG.F.: Fault condition programmed in the curve (follows the curve condition)  
 BLK02: BLINK T=0.2"  
 BLK1: BLINK T=1"  
 BLK2: BLINK T=2"

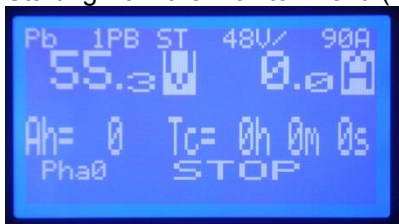


### 11)USER Menu

The user can interact with the battery charger using the buttons on the panel with the functions below:

BUTTON	FUNCTION	DESCRIPTION
P1	SETUP / INCREASE :	it allows to enter the menus, navigate, edit/increase a parameter
P2	PARAMETERS/DECREASE:	it allows to navigate between the various MONITOR menus (1,2 and 3), by displaying various pages with the charging parameters, edit/decrease the parameters
P3	ON-OFF / SELEZIONE:	it allows to interrupt or resume current charging, select a menu, confirm the value of a parameter

Starting from the Monitor menu (MONITOR1),



By pressing the button P1, the following menu is activated "MENU PRINCIPALE 1"



**NOTE: Some of the menus illustrated active only when the user has entered the PWD of the technical service.**

In this menu the buttons have the following functions:

P1, P2:	allow to move UP/DOWN in the menu and select a submenu
P3 :	selects a submenu and allows to enter it

Here is the description of the various items of the menu :

MENU	DESCRIPTION
MONITOR	It goes back to the MONITOR1 Menu, which allows display the current charging parameters and the charging curve conducted.
OLD-DATA	allows to view the long of the recent charging cycles conducted
INFO	It displays the V/A of the battery charger, the name of the curve currently active, the version of the HW power of the CB, by pressing the P3 button it is possible to display the BIOS and FW versions.
PROGRAM	It allows to: <ul style="list-style-type: none"> <li>- Enter the access credentials that qualify the user as a "TECHNICIAN"</li> <li>- For TECHNICIAN uses it allows to view and program parameters on the battery charger related to the charging curves</li> </ul>
TEST	It allows to enter in manual testing mode (PWD protected)

## 12) MONITOR Menu

As mentioned earlier, the battery charger offers 3 monitor menus. You can use the P2 button, whose function has been illustrated earlier, to navigate between the menus

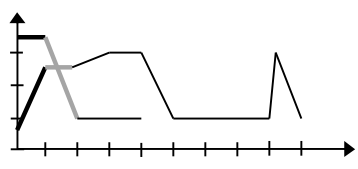


Below is a summary of the information reported respectively in the 3 MONITOR displays.

### MONITOR1

ROW	EXAMPLE	DESCRIPTION
(1)	Pb 1Pb ST 48V /35A	Technology of the Battery, Type of Curve, Size of the battery charger
(2)	43.3 V 35A	Battery voltage and current
(3)	Ah= 8 Tc= 0h15m29s	Ah charged, Charging time in hours, min, sec
(4)	PhI1 CHARGE	Current charging phase, STATUS or the battery charger (eg. phase = auto start A0, Status= BATTERY NOT CONNECTED)
(5)	-- Messages	Possible fault or status messages

### MONITOR2

ROW	EXAMPLE	DESCRIPTION
(1)	43.4V 35A	Battery Voltage and Current
(2)		Active charging profile indicating : - Phase completed (bold line) - Current phase (flashing line) - Phase to conduct (Thin line)
(3)	7Ah PhI1 13m22s	Ah charged, Charging time in hours, min, sec
(4)	-- Message	Possible fault or status Messages

### MONITOR3

ROW	EXAMPLE	DESCRIPTION
(1)	CYCLE N= 53 - Ph 2	Number of charging cycle and current charging phase E.g.: charging cycle 53 and Phase 2
(2)	ClID=1PB ST_01.0001	Unique code of the charging curve
(3)	Vbif=2.39V/el = 57.4V	Battery voltage at the beginning of the phase (Vbif) first expressed as element voltage (V/el) and then as absolute voltage (V)
(4)	Vbef=2.40V/el = 57.7V	Battery voltage at the end of the phase (current phase) (Vbef) first expressed as element voltage (V/el) and then as absolute voltage (V)
(5)	Ibif= 33A Ibef= 21A	Current at the beginning of the phase (Ibif) and current at the end of the phase (Ibef)
(6)	Tf =0h0m Tef=0hm	Time of the individual phase (Tf) and Overall charging time at the end of the phase (Tef)
(7)	Ahf= 0 AhEf = 0	Ah output in the selected phase Ahf) and overall charged Ah (AhEf)
(8)	-- Message	It reports any faults that took place during the charging cycle

### 13) OLD-DATA Menu

By accessing the OLD-DATA MENU from the MAIN MENU, there are two options are shown below.



By selecting option 1 and confirming with the P3 button, you access the menu to view the long of the latest 50 charging processes.

By selecting option 2 you can reset the log (**only with the Technician PWD**).



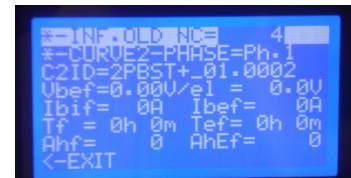
By entering the visualisation it is possible to say that the cycle and the phase of the cycle Of which you want to read the data saved.

Here is an example:

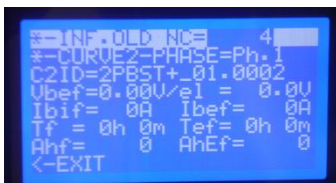
- a) Setting the charging CYCLE of which we want to view the charging data



- 1.Select row 1 (CYCLE) (P3)
- 2.Edit NC (P1,P2)
- 3.Exit (P3)



- b) Setting the charging PHASE of which we want to view the charging data



- 1.Select row 2 (PHASE) (P3)
- 2.Edit Ph. (P1,P2)
- 3.Exit (P3)



In this menu the buttons have the following functions:

P1, P2:	allow to move UP/DOWN in the menu (rows 1 and 2) and select a submenu
P3 :	selects a submenu and allows to enter it

Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(1)	*-OLD-DATA NC= 4	Allows to select the charging cycle of which you want to view the parameters (it stores the latest 50 cycles and overwrites the oldest ones).
(2)	*-CURVE2-PHASE =Ph.1	Allows to select the number of the phase of which you want to view the charging parameters.
(3)	C_ID= 2PB ST+ 01.0002	It displays the unique identification code of the curve
(4)	Vbef=2.44V/e1 = 58.6V	Battery voltage at the end of the phase (current phase) (Vbef) first expressed as element voltage (V/e1) and then as absolute voltage (V)
(5)	Ibif= 35A Ibef= 21A	Current at the beginning of the phase (Ibif) and current at the end of the phase (Ibef)
(6)	Tf =10h33m Tef=10h33m	Time of the individual phase (Tf) and Overall charging time at the end of the phase (Tef)
(7)	Ahf= 45 AhEf= 250	Ah output in the selected phase Ahf) and overall charged Ah (AhEf)
(8)	<-ESCI	It allows to exit the menu

By instead selecting Option 2>RESET DATA you access the display from which, using P2, it is possible to research the log and with P3 exit the menu.



#### 14)PROGRAM Menu

By entering the PROGRAMME Menu, without entering the pass word for technicians, there is only option 1, which allows to edit the user parameters, including the password itself.



By entering this menu the USER PARAM window is displayed as shown below

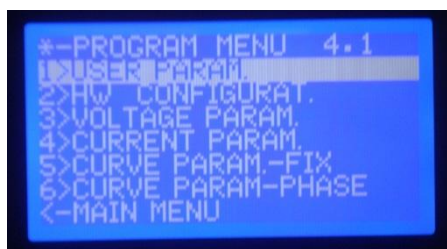


In this menu it is possible to edit the parameters below:

ROW	ITEM	DESCRIPTION
(2)	1-LANGUAGE	It allows to set the display language on the LCD
(3)	2-TEMPERAT.M.U	It allows to set the unit of measurement of the temperature : °C or °F
(4)	3-GRAPHIC SampT	It allows to set the sampling time of the graph
(5)	4-PASSWORD INS.	It allows to enter the PWD to unlock access to the programming of the battery charger. If a value equal to .PASSWORD MOD. is entered in this field the MOD. PASSWORD field displays the same value entered. Otherwise it displays a field with '*' (INS.PASSWORD corresponds to the access KEY).
(6)	5-PASSWORD MOD.	This field displays the value of the PWD if entered correctly or, alternatively, the field of asterisks. When the value of the PWD entered is correct and displayed, the value of the PWD itself can be edited in this field.
(7)	*-SAVE PARAMETERS	Once the value of the new password has been set, it is necessary to go down to row "*-SAVE PARAMETERS " and confirm using the P3 button. This field corresponds to the concept of « lock ».
(8)	<-EXIT	It allows to exit the menu

Once the parameter has been changed, this becomes effective only if before exiting the current menu the \*-SAVE PARAMETERS control is selected

Once the PWD that qualifies the user as a technician (1973) has been entered, the EXTENDED PROGRAM menu appears, as shown below.



Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(1)	*-MENU PROGRAM 4."	Heading of the menu
(2)	1>USER PARAM.	It allows to enter the menu to set the user parameters (described earlier)
(3)	2>HW CONFIGURAT. (1)	It allows to enter a menu to display the DIP SW on the CSP205 board
(4)	3>VOLTAGE PARAM. (1)	It allows to enter the menu to set the voltage parameters of the battery charger
(5)	4>CURRENT PARAM. (1)	It allows to enter the menu to set the current parameters of the battery charger
(6)	5>CURVE PARAM.-FIX (1)	It allows to enter the menu to set the general parameters of the active curve
(7)	6>CURVE PARAM-PHASE (1)	It allows to enter the menu to set the parameters related to the individual phases of the active curve
(8)	<- MAIN MENU	It allows to return to the main menu
	Note (1)	This can only be displayed with the PWD of the Technical Service

### 15)HW CONFIGURATION Menu

**Note : This menu is only displayed after the PWD of the Technical Service has been entered.**

This menu leads to the page to see the DIP SW configuration on the PBM205 board and to specify the HW configuration of the charger.



The only parameter that cannot be changed is MODE, which describes the configuration of the power modules present :

- 0: SINGLE : It corresponds to the case of one power controlled by a single control board
- 1: SLAVE : it corresponds to the case of SLAVE logic board that is controlled by another MASTER board. In this case it is possible to have more than one slave unit and it is therefore necessary to also define a unique address to the programmed slave.
- 2: MASTER : It corresponds to the case of MASTER logic board that controls a SLAVE control board. In this case it is possible to have more than one slave unit and it is therefore necessary to also define the number of SLAVE modules controlled.

As for the display of the settings of the DIP-SW, the content displayed on this menu cannot be changed by the user unless he or she intervenes at a HW level on the DIP-SWITCH on the control board.

Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(1)	MODE: 2-MASTER, NSL=01	It defines the logic configuration, where this control card is a MASTER that drives on SLAVE control card
(2)	SW1.1-2-3-4: 3= UNIV.OLD	dip-sw that are used to select the type of power board connected
(3)	SW1.5=NTC-TBATT :	it enables the measurement of a NTC probe to read the temperature of the battery
(4)	SW1.6-7=PBM168 N.	Are used to enable the presence of PBM168 type expansion boards (0,1,2,3 PBM168 boards)
(5)	SW1.8=DISPO	Not used
(6)	P3=ESC	It allows to exit the Menu
(7)	*-SAVE PARAMETERS	It allows to save the parameters' settings
(8)	<-EXIT	It allows to exit the menu

## 16)VOLTAGE PARAMETERS

**Note : This menu is only displayed after the PWD of the Technical Service has been entered.**

This menu allows to display and edit the parameters related to the type of battery, no. of cells and rated, minimum and maximum voltage



Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(2)	1-NOMIN.VOLT.= 96.0V	It defines the rate voltage of the Battery charger
(3)	2-MINIM.VOLT.= 2.4V	It defines the minimum admitted voltage for the battery charger to acknowledge the presence of the battery.
(7)	*-SAVE PARAMETERS	It allows to save the parameters' settings
(8)	<-EXIT	It allows to exit the menu

## 17)CURRENT PARAMETERS

**Note : This menu is only displayed after the PWD of the Technical Service has been entered.**

This menu allows to display and edit the parameters related to the current output of the battery charger.



Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(2)	1-ISHUNT @100mV=	This parameter allows to select the shunt current, provided there is a 100mV shunt
(3)	2-CORRENTE NOM= (RAT:CURRENT)	<b>RAT CURRENT:</b> This parameter allows to select the rated current of the battery charger.
(7)	*-SAVE PARAMETERS	It allows to save the parameters' settings
(8)	<-EXIT	It allows to exit the menu



### 18)FIXED CURVE PARAMETERS

**Note : This menu is only displayed after the PWD of the Technical Service has been entered.**

This menu allows to select the active charging curve (among the ones available in the memory (8 curves)), the technology of the Battery (Pb, NiCd, LiPo), the Rated and Maximum Voltage parameters for each element and, finally, access the submenu, which is not described here, used for Universal battery charges.



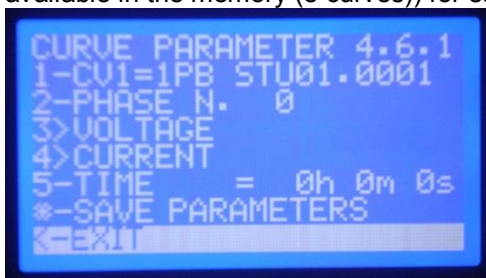
Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(2)	1-CV1=1PB STU01.0001	It allows to select one of the 8 curves in the memory, of which it reports the unique identifier.
(3)	2-BATTERY TYPE=0PB	It allows to select the technology of the Battery: 0: Lead (Acid, Gel or AGM) 1: NiCd 2: LiPo
(4)	4-NOM.BATT. Vel= 2.00	It allows to set the Rat voltage of the element
(5)	5-MAX.BATT. Vel= 2.80	It allows to set the Max voltage of the element
(6)	6>UNIVERS. PARAM	It allows to enter the menu dedicated to the Multivoltage CBs
(7)	*-SAVE PARAMETERS	It allows to save the parameters' settings
(8)	<-EXIT	It allows to exit the menu

### 19)PHASE CURVE PARAMETERS

**Note : This menu is only displayed after the PWD of the Technical Service has been entered.**

This menu allows to display and edit the parameters related to the selected charging curve (among the ones available in the memory (8 curves)) for each phase ( voltages, currents, timers).



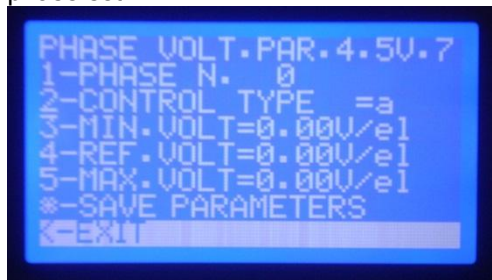
Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(2)	1-CV1=1PB ST_01.0001	It allows to select one of the 8 curves in the memory, of which it reports the unique identifier.
(3)	2-PHASE N. 0	It allows to select the phase, inside the selected curve, of which you want to view/edit the charging parameters.
(4)	3>VOLTAGE	It allows to enter the menu to program the operating voltages of the charging phase
(5)	4>CURRENT	It allows to enter the menu to program the operating currents of the charging phase
(6)	5-TIME = 0h 0m 5s	It allows to view and program the Timer to exit the selected phase. The 0 phase corresponds to the Autostart phase and the TIME displayed corresponds to the Autostart Timer in Count-Down mode.
(7)	*-SAVE PARAMETERS	It allows to save the parameters' settings
(8)	<-EXIT	It allows to exit the menu

## 20) PHASE VOLTAGE PARAMETERS

**Note : This menu is only displayed after the PWD of the Technical Service has been entered.**

This menu allows to display and edit the parameters related to the voltages of the curve and of the charging phase set.



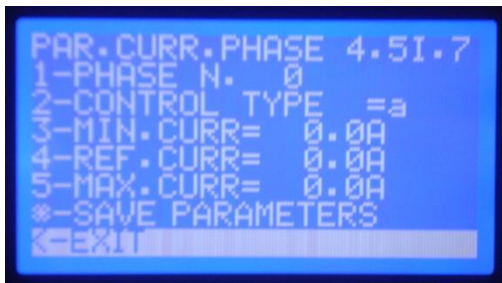
Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(2)	1- PHASE N. 0	It allows to select the phase, inside the selected curve, of which you want to view/edit the charging parameters.
(3)	2-CONTROL TYPE=a	It allows to view the type of charge control conducted in this phase : a: Stop I : Constant current U: Constant voltage W: Current decreases as the voltage increases.
(4)	3-MIN.VOLT= 1.00V/e1	It allows to define the minimum admitted voltage to recognise the battery. This parameter can be used to define a phase switch or fault condition. (it is the reference that define a phase switch).
(5)	4-REF.VOLT= 0.00V/e1	It allows to define the voltage of reference. This parameter defines the Voltage to be controlled for the Constant voltage phases (U)
(6)	5-MAX.VOLT= 2.30V/e1	It allows to define the maximum at receptive voltage for the battery (the voltage at which the presence of the battery is detected). This parameter can be used to define a phase switch or a fault condition (it is the reference that define a phase switch).
(7)	*-SAVE PARAMETERS	It allows to save the parameters' settings
(8)	<-EXIT	It allows to exit the menu

## 21) PHASE CURRENT PARAMETERS

**Note : This menu is only displayed after the PWD of the Technical Service has been entered.**

This menu allows to display and edit the parameters related to the currents of the curve and of the charging phase set.



Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(2)	1-PHASE N. 0	It allows to select the phase, inside the selected curve, of which you want to view/edit the charging parameters.
(3)	2-CONTROL TYPE = a	It allows to view the type of charge control conducted in this phase : a: Stop I : Constant current U: Constant voltage W: Current decreases as the voltage increases.
(4)	3-MIN CURR.= 0.0A	It allows to define the minimum admitted current of the battery charger for the current phase. This parameter can be used to define a phase switch or a fault condition. (it is the reference that define a phase switch).
(5)	4-REF CURR.= 0.0A	It allows to define the current of reference. This parameter defines the testing current for the Constant current phases (I)
(6)	5- MAX CURR.= 0.0A	allows to define the maximum admitted current of the battery charger for the current phase. This parameter can be used to define a phase switch or a fault condition (it is the reference that define a phase switch).
(7)	*-SAVE PARAMETERS	It allows to save the parameters' settings
(8)	<-EXIT	It allows to exit the menu

## 22) MANUAL TEST

**Note : This menu is only displayed after the PWD of the Technical Service has been entered.**

This menu allows to set the analogue instruments of the battery charger (Voltage and Currents reading) and to conduct a manual test on the battery charger, which can be useful at the failure diagnostics stage.



Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(2)	1-V-PWM=1000 > 0.0V	It displays the value of the testing PWM of the voltage of the PWM (in this case at the maximum)
(3)	2-I-PWM= 204 > 0.0A	It allows to manage the current control input of the PWM (in this case at the minimum)
(4)	3- CONTACTOR = OFF	It allows to manage the output Contactor enabling control (if any)
(5)	4-ENABLE= OFF	It allows to manage the ENABLE control of the PWM (which enables the power output)
(6)	5>CALIBRAT	It allows to enter the Settings menu of the analogue instruments to read the Voltage and Current
(7)	6>TEST Relays AUX	It allows to check if the auxiliary relays are operating correctly
(8)	<-EXIT	It allows to exit the menu

**EXAMPLE OF MANUAL TEST AT CONSTANT CURRENT**

- 1) Enable the Contactor if any
- 2) Enable the Enable of the PWM
- 3) Check the output current by moving the current PWM PWM-I



1) ENABLE THE OUTPUT CONTACTOR (IF ANY)



2) ENABLE THE ENABLE



3) SLOWLY AND GRADUALLY BRING THE PWM-I VALUE TO THE DESIRED VALUE (by staying within the current on the plate of the CB)



## 23) CALIBRATIONS

**Note : This menu is only displayed after the PWD of the Technical Service has been entered.**

Starting from the TEST menu and selecting submenu 5- CALIBRATIONS, you can access the menu below from which it is possible to conduct the calibration of the Current and Voltage measurement instruments.



Here is the description of the various items of the menu :

ROW	ITEM	DESCRIPTION
(2)	1-CalVb= 9.9> 0.0V	It allows to calibrate the reading of the battery's voltage
(3)	2-CalIb= -4.7> 0.0A	It allows to calibrate the reading of the battery's current
(4)	3-Rcabl= 8.4mohm	It allows to calibrate the measurement of the cables' resilience in order to correct the voltage reading on the battery according to the current output
(5)		
(6)	5>TEST NORMAL	It allows to return to manual TESTING menu
(7)	*-SAVE PARAMETERS	It allows to save the parameters' settings
(8)	<-EXIT	It allows to exit the menu

### CALIBRATION PROCEDURES

The calibration procedure consists of a sequence of 3 operations that should be conducted in the order investigated, which aimed to calibrate the reading of the voltage with current output at zero, the reading of the current output, the value of the resilience of the cables.

#### a) VOLTAGE READING CALIBRATION PROCEDURE:

- 1) Can the battery to a Multimeter between Positive and are Negative pole and amperometric pliers on one of the battery's cables.
- 2) Enter the TEST menu ( the battery charger goes to standby)
- 3) Enter the CALIBRATIONS menu
- 4) Select the TarVb row and change the value of the percentage error so that the reading of the battery charger will be the same of that of the multimeter.
- 5) Exit the programming using P3
- 6) Go to row 6 (\*-SAVE PARAMETERS ) (SAVE VALUES) and save the values by pressing P3.
- 7) Go to 5<TEST NORMAL
- 8) Confirm with P3
- 9) Go back to the Test menu

**b) CURRENT READING CALIBRATION PROCEDURE:**

- 1) Select the ENABLE row answer the ON value
- 2) Move to row PWM-I (row 3) and change the value of the PWM-I so that the output current is equal to the rated current of the CB
- 3) Go back to the CALIBRATIONS menu
- 4) Go to row 2 ( 2-CalIc=+12.5% 0.0A)
- 5) Change the TarIC value so that the current reading the battery charger corresponds with the reading of the Ampermetric pliers

**c) CABLE RESISTANCE CALIBRATION PROCEDURE:**

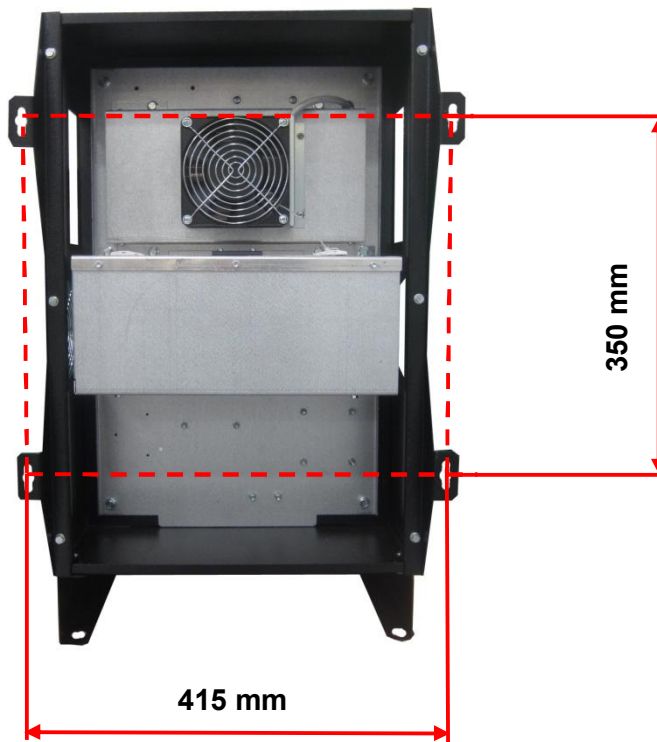
- 1) The presence of current on the battery cables will determine our difference in the voltage reading between the battery charger and the Multimeter.
- 2) Go to row 3 ( Rcabl= ) and change the value until the voltage reading of the battery charger corresponds with the reading of the Multimeter again.
- 3) Go to row 6 (\*-SAVE PARAMETERS ) and select it by pressing P3. when MEMO flashes supplies that means that the liberation values have been actually saved.
- 4) Go to row 7 (<-EXIT ) and confirm with P3

**24)WARRANTY**

- *The machine is guaranteed 12 months from the date of installation.*
- *The warranty covers the parts that result faulty in manufacture or assembly.*
- *The warranty does NOT cover damage caused by bad use and/or incorrect installation.*
- *The warranty becomes NULL AND VOID if tampering is detected.*
- *For any problems, contact the AUTHORISED DEALER or P.B.M. S.r.l. directly.*

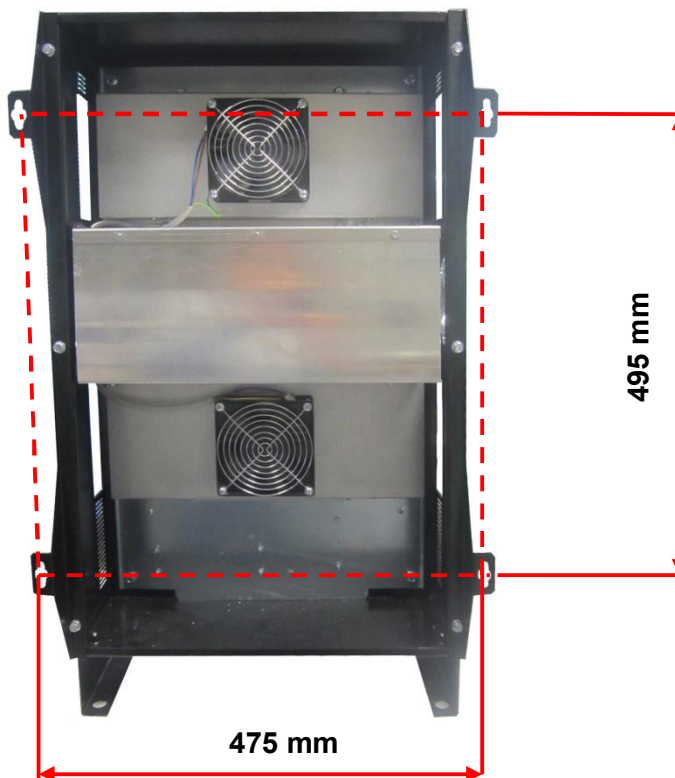
25) WALL MOUNTING

BOX N



Dimensions :  
440 (L) x 665 (H) x 380 (P) mm

BOX L

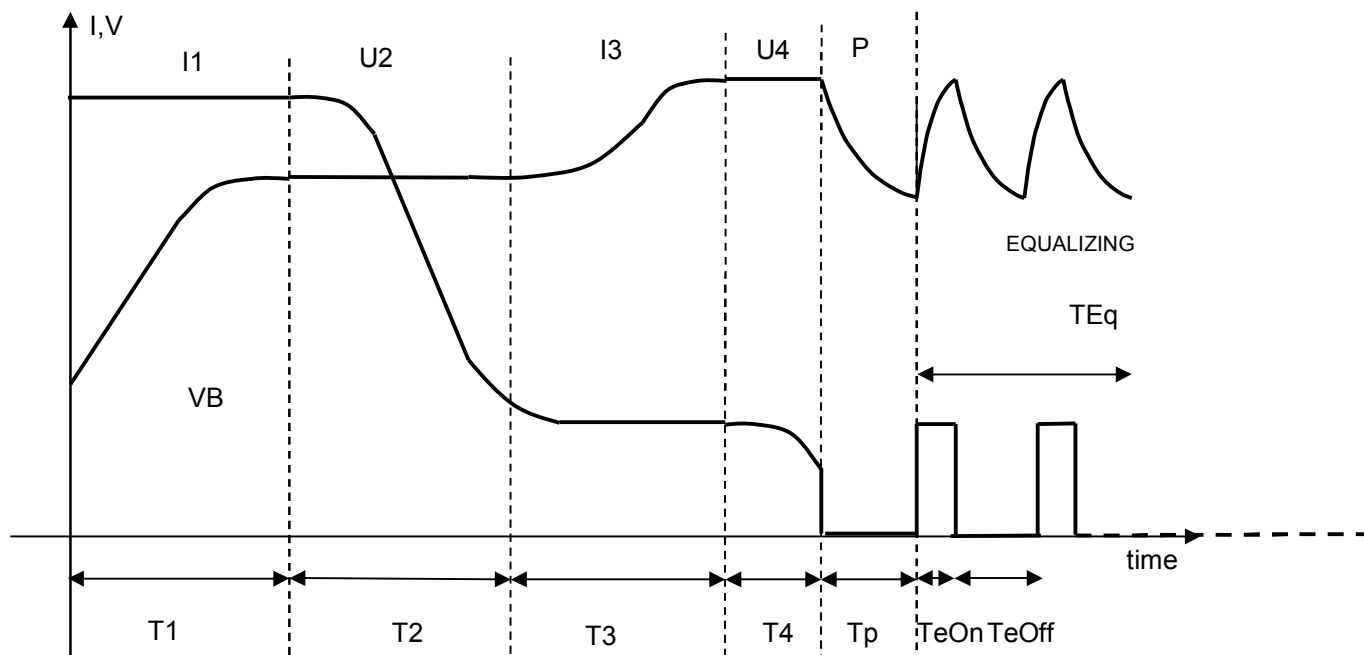


Dimensions :  
500 (L) x 810 (H) x 400 (P) mm

APPENDIX: CHARGING CURVE PROFILE

1) Profile **LEAD Acid STD IUIUa**

<b>Profile</b>	IUIUa+Eq Lead Acid STD – 12,5-16,7 A/100Ah C5 between 6 and 8 time Inom
<b>ID</b>	1 PB ST_01.0002
<b>Release</b>	rev 1.0002
<b>Date</b>	08/05/2012



**Time Table**

T1	T2	T3	T4	Tp	TeOn	TeOff	TEq
8h (Sic)	3h	2h:30min	30min	1h	10min	50min	6h

**Voltage Table**

U1	U2	U3	U4	UeOn	Uemin
2,40 (threshold)	2,40 cost	2,70 (threshold)	2,70 cost	2,75 max	2,05 min

**Current Table**

I1	I2	I3	I4	IeOn	IeOff
12,5-16 A/100Ah	1/3 * I1 (threshold)	1/3 * I1 cost	1/3 * I1 max	1/3 * I1 max	0





**Fixed Profile Parameters**

**HF205 - SET CURVE PARAMETERS 1 - 8 ON LINE**

FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 12:10:07

SERIAL NUMBER 0003  
Battery BATT01234567  
Customer \*\*\*\*\*  
Operator \*\*\*\*\*

Curva 1 1 PB ST\_01.0002  
CYCLE NUMBER 2

Battery Voltage Parameters	
Type of Battery	0-Pb
Element Rat. Volt.	2,00 (V)
Max Control Volt.	2,80 (V/el)
<input type="checkbox"/> Start without battery (F0 - F1)	
<input type="checkbox"/> Enable Rated Voltage Variation	
Number Battery Elements	24
Battery Rated Voltage	48 (V)

Battery Current Parameters	
<input type="checkbox"/> Enable Nominal Current Variation	
Nominal charging Current	80,0 (A)

Num current phases	4
F1/F7 - Timeout current charging	<input type="radio"/> Off <input checked="" type="radio"/> 14:00 (hh:mm) <input type="radio"/> P3
TSIC Fault Signal	<input type="radio"/> Off <input checked="" type="radio"/> On
Tprop	0-OFF
Ahprop	0-OFF
dVF	<input type="radio"/> Off <input checked="" type="radio"/> 18 / 36 (mVel / min)
Reset due to power cut	<input type="radio"/> Off <input checked="" type="radio"/> On
F8 - PAUSE at charging end	1:00 (hh:mm)
F9/F12 - Equalization	<input type="radio"/> Off <input checked="" type="radio"/> 6 (N/24h) <input type="radio"/> ∞
F9 - Tskip Equalization on	<input type="radio"/> Off <input checked="" type="radio"/> 3 (hh)
<i>(Skip 1' Equalizzazione on, se ore di carica compressive &lt; di Tskip)</i>	
F9 - T.on Equalization	10 (min)
F9 - Vlim Equalization	<input type="radio"/> Off <input checked="" type="radio"/> 2,75 (V/el)
F9 - Iref Equalization	16,0 (A) <input checked="" type="checkbox"/> Zero current contrast
F10 - T.off Equalization	50 (min)
F11 - Current Equalization Cycle T.	60 (ore)
<i>(Time in hours of current equalization)</i>	
F12 - Repeat Equal. Cycle pause T.	<input type="radio"/> Off <input checked="" type="radio"/> 120 (ore)
<i>(Pause in hours for repeating current equalization)</i>	
F8/F10/F11/F12-Vmin Equal. Restart	<input type="radio"/> Off <input checked="" type="radio"/> 2,05 (V/el)
F13-Trickle charge	<input checked="" type="radio"/> Off <input type="radio"/> --- (hh) <input type="radio"/> ∞
F13-Vref Trickle charge	--- (V/el)
F13-Iref Trickle charge	<input checked="" type="radio"/> Off <input type="radio"/> --- (A) <input type="checkbox"/> Zero current contrast

**Phase Profile Parameters**

**HF205 - PARAMETRI FASE CURVA ON LINE**

FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 12:12:35

SERIAL NUMBER 0003  
Battery BATT01234567

Customer \*\*\*\*\*  
Operator \*\*\*\*\*

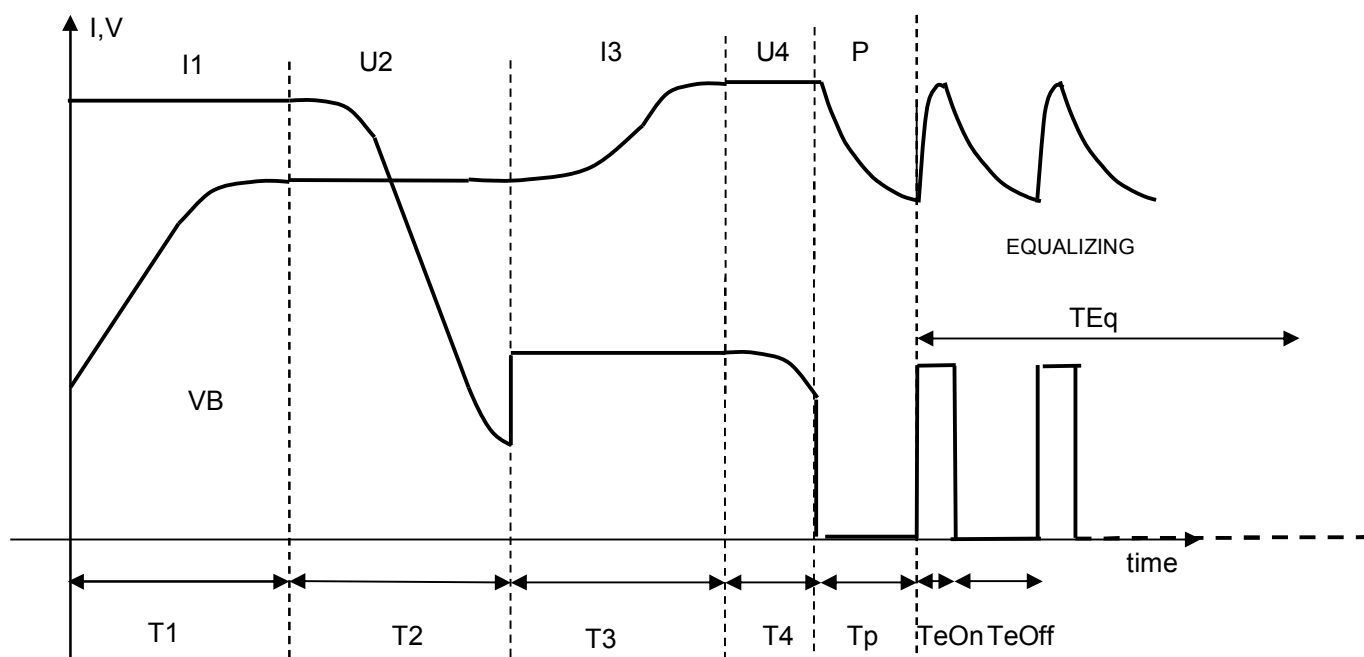
Curva 1 ID: 1 PB ST\_01.0002  
CYCLE NUMBER 2

	START	PHASE 1	PHASE 2	PHASE 3	PHASE 4
Test		1-I-Direct Current	2-U-Constant	1-I-Direct Current	2-U-Constant
Vref (V/el)		0,00	2,40	0,00	2,70
Vmin (V/el)	1,00	0,00	0,00	0,00	0,00
Vmax (V/el)	2,30	2,40	0,00	2,70	0,00
Iref (A)		80,0	0,0	26,6	26,6
Imin (A)	0,0	0,0	26,6	0,0	0,0
Imax (A)	0,0	0,0	85,7	0,0	0,0
Tref (h.m.s)	0:00:05	8:00:00	3:00:00	2:30:00	0:30:00
TbRef (NTC)	°C	°C	°C	°C	°C
Condit1	14-T>=Tref	4-V>=Vmax	7-I<Imin	4-V>=Vmax	0-OFF
Next C1	1-FASE1	2-FASE2	3-FASE3	4-FASE4	
Condit2	0-OFF	0-OFF	14-T>=Tref	14-T>=Tref	14-T>=Tref
Next C2			3-FASE3	8-PAUSA	8-PAUSA
Condit3	0-OFF	0-OFF	10-I>=Imax	19-dVdT<dVTF	0-OFF
Next C3			1-FASE1	8-PAUSA	
Condit4	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
Next C4					
Condit5	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
Next C5					
Condit6	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
Next C6					
Cond. ALL 1	0-OFF	14-T>=Tref	0-OFF	0-OFF	0-OFF
Next Call1		15-AL.STOP			
Cond. ALL 2	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
Next Call2					
Zero current		<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off
SpecFunc1	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc2	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc3	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc4	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc5	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc6	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc7	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc8	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF



## 2) Profile LEAD Acid STD PLUS IUIUa

<b>Profile</b>	IUIUa+Eq Lead Acid STD PLUS- 10-12.5 A/100Ah C5 between 8 and 10 time Inom
<b>ID</b>	2 PB ST+_01.0002
<b>Release</b>	rev 1.0002
<b>Date</b>	08/05/2012



### Time Table

T1	T2	T3	T4	Tp	TeOn	TeOff	Teq
10h (Sic)	3h	2h:30min	30min	1h	10min	50min	6h

### Voltage Table

U1	U2	U3	U4	UeOn	Uemin
2,40 (threshold)	2,40 cost	2,70 (threshold)	2,70 cost	2,75 max	2,05 min

### Current Table

I1	I2	I3	I4	IeOn	IeOff
10-12,5 A/100Ah	1/ 3.88 * I1 (threshold)	1/2,33 * I1 cost	1/2,33 * I1 max	1/2,33 * I1	0

**Fixed Profile Parameters**

**HF205 - SET CURVE PARAMETERS 1 - 8 ON LINE** FW: Main:b2.37-14.10.2011 - SW: V: 1  
Print Date Time 08/05/2012 12:21:4

SERIAL NUMBER 0003 Battery BATT01234567 Customer **** Operator ****	<b>Curva 2</b> <b>CYCLE NUMBER</b>	<b>2 PB ST+ _01 .0002</b> <b>2</b>
<b>Battery Voltage Parameters</b>	Num current phases 4	
Type of Battery 0-Pb	F1/F7 - Timeout current charging <input type="radio"/> Off <input checked="" type="radio"/> 16:00 (hh:mm) <input type="radio"/> P3	
Element Rat. Volt. 2,00 (V)	TSIC Fault Signal <input type="radio"/> Off <input checked="" type="radio"/> On	
Max Control Volt. 2,80 (V/el)	Tprop 0-OFF	
<input type="checkbox"/> Start without battery (F0 - F1)	Ahprop 0-OFF	
<input type="checkbox"/> Enable Rated Voltage Variation	dVf <input type="radio"/> Off <input checked="" type="radio"/> 20 / 30 (mVel / min)	
Number Battery Elements 24	Reset due to power cut <input type="radio"/> Off <input checked="" type="radio"/> On	
Battery Rated Voltage 48 (V)	F8 - PAUSE at charging end 1:00 (hh:mm)	
<b>Battery Current Parameters</b>	F9/F12 - Equalization <input type="radio"/> Off <input checked="" type="radio"/> 6 (N/24h) <input type="radio"/> ∞	
<input type="checkbox"/> Enable Nominal Current Variation	F9 - Tskip Equalization on <input type="radio"/> Off <input checked="" type="radio"/> 3 (hh)	
Nominal charging Current 80,0 (A)	<i>(Skip 1' Equalizzazione on, se ore di carica complessive &lt; di Tskip)</i>	
	F9 - T.on Equalization 10 (min)	
	F9 - Vlim Equalization <input type="radio"/> Off <input checked="" type="radio"/> 2,00 (V/el)	
	F9 - Iref Equalization 0,1 (A)	<input checked="" type="checkbox"/> Zero current contrast
	F10 - T.off Equalization 50 (min)	
	F11 - Current Equalization Cycle T. 60 (ore)	
	<i>(Time in hours of current equalization)</i>	
	F12 - Repeat Equal. Cycle pause T. <input type="radio"/> Off <input checked="" type="radio"/> 120 (ore)	
	<i>(Pause in hours for repeating current equalization)</i>	
	F8/F10/F11/F12-Vmin Equal. Restart <input type="radio"/> Off <input checked="" type="radio"/> 2,00 (V/el)	
	F13-Trickle charge <input checked="" type="radio"/> Off <input type="radio"/> --- (hh) <input type="radio"/> ∞	
	F13-Vref Trickle charge --- (V/el)	
	F13-Iref Trickle charge <input checked="" type="radio"/> Off <input type="radio"/> --- (A)	<input type="checkbox"/> Zero current contrast

**Phase Profile Parameters**

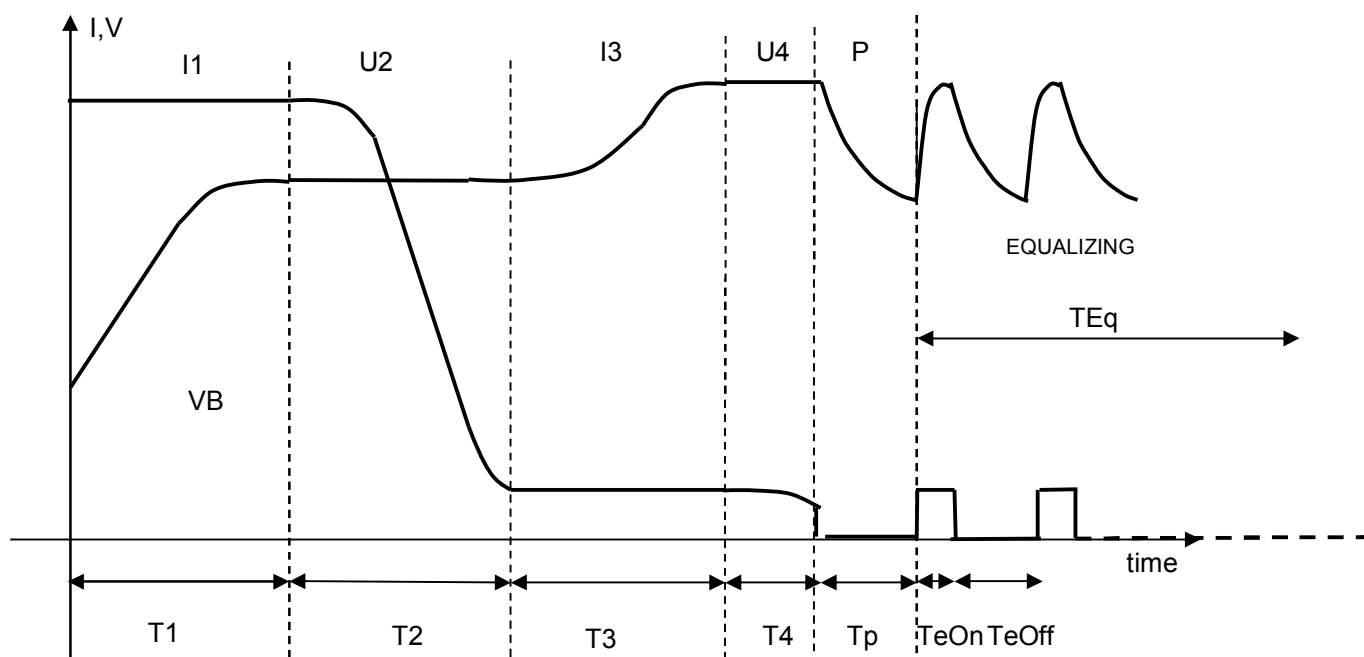
**HF205 - PARAMETRI FASE CURVA ON LINE** FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 12:19:25

SERIAL NUMBER 0003 Battery BATT01234567	<b>Curva 2</b> <b>CYCLE NUMBER</b>	<b>ID: 2 PB ST+ _01 .0002</b> <b>2</b>		
	Customer **** Operator ****			
<b>START</b>	<b>PHASE 1</b>	<b>PHASE 2</b>	<b>PHASE 3</b>	<b>PHASE 4</b>
Test	1-I-Direct Current	2-U-Constant	1-I-Direct Current	2-U-Constant
Vref (V/el)	0,00	2,40	0,00	2,70
Vmin (V/el)	1,00	0,00	0,00	0,00
Vmax (V/el)	2,30	2,40	0,00	0,00
Iref (A)	0,0	80,0	34,3	34,3
Imin (A)	0,0	0,0	0,0	0,0
Imax (A)	0,0	0,0	85,7	0,0
Tref (h:m:s)	0:00:05	10:00:00	3:00:00	2:30:00
TbRef (NTC) °C	14-T>=Tref	4-V>=Vmax	7-I<Imin	4-V>=Vmax
Condit1	14-T>=Tref	4-V>=Vmax	7-I<Imin	4-V>=Vmax
Next C1	1-FASE1	2-FASE2	3-FASE3	4-FASE4
Condit2	0-OFF	0-OFF	14-T>=Tref	14-T>=Tref
Next C2	0-OFF	0-OFF	3-FASE3	8-PAUSA
Condit3	0-OFF	0-OFF	10-I>=Imax	19-dVdT<dVTF
Next C3	0-OFF	0-OFF	1-FASE1	8-PAUSA
Condit4	0-OFF	0-OFF	0-OFF	0-OFF
Next C4	0-OFF	0-OFF	0-OFF	0-OFF
Condit5	0-OFF	0-OFF	0-OFF	0-OFF
Next C5	0-OFF	0-OFF	0-OFF	0-OFF
Condit6	0-OFF	0-OFF	0-OFF	0-OFF
Next C6	0-OFF	0-OFF	0-OFF	0-OFF
Cond. ALL 1	0-OFF	14-T>=Tref	0-OFF	0-OFF
Next Call1	0-OFF	15-AL.STOP	0-OFF	0-OFF
Cond. ALL 2	0-OFF	0-OFF	0-OFF	0-OFF
Next Call2	0-OFF	0-OFF	0-OFF	0-OFF
Zero current	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off
SpecFunc1	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc2	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc3	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc4	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc5	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc6	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc7	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc8	0-OFF	0-OFF	0-OFF	0-OFF



### 3) Profile LEAD GEL IUIUa

<b>Profile</b>	IUIUa+Eq Lead GEL 12.5-16.7 A/100Ah C5 between 6 and 8 time Inom
<b>ID</b>	3-0002-C3-Pb
<b>Release</b>	rev 1.0002
<b>Date</b>	08/05/2012



**Time Table**

T1	T2	T3	T4	Tp	TeOn	TeOff	Teq
8h (Sic)	4h	3h:30min	30min	1h	10min	50min	6h

**Voltage Table**

U1	U2	U3	U4		Ueon	Uemin	
2,35 (threshold)	2,35 cost	2,65 (threshold)	2,65 cost		2,75 max	2,05 min	

**Current Table**

I1	I2	I3	I4		Ieon	Ieoff	
12,5-16,7 A/100Ah	1/ 12 * I1 (threshold)	1/12 * I1 cost	1/12 * I1 max		1/12 * I1	0	

**Fixed Profile Parameters**

FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 12:33:10

**HF205 - SET CURVE PARAMETERS 1 - 8 ON LINE**

SERIAL NUMBER 0003      **Curva 3**      **3 PB GEL\_01 .0002**  
 Battery BATT01234567      **CYCLE NUMBER**      **2**  
 Customer \*\*\*\*  
 Operator \*\*\*\*

Battery Voltage Parameters		Num current phases	
Type of Battery	0-Pb	4	
Element Rat. Volt.	2,00 (V)	F1/F7 - Timeout current charging	<input type="radio"/> Off <input checked="" type="radio"/> 16:00 (hh:mm) <input type="radio"/> P3
Max Control Volt.	2,80 (V/el)	TSIC Fault Signal	<input type="radio"/> Off <input checked="" type="radio"/> On
<input type="checkbox"/> Start without battery (F0 - F1)		Tprop	0-OFF
<input type="checkbox"/> Enable Rated Voltage Variation		Ahprop	0-OFF
Number Battery Elements	24	dVF	<input type="radio"/> Off <input checked="" type="radio"/> 10 / 40 (mV/el / min)
Battery Rated Voltage	48 (V)	Reset due to power cut	<input type="radio"/> Off <input checked="" type="radio"/> On
Battery Current Parameters		F8 - PAUSE at charging end	1:00 (hh:mm)
<input type="checkbox"/> Enable Nominal Current Variation		F9/F12 - Equalization	<input type="radio"/> Off <input checked="" type="radio"/> 6 (N/24h) <input type="radio"/> ∞
Nominal charging Current	80,0 (A)	F9 - Tskip Equalization on	<input type="radio"/> Off <input checked="" type="radio"/> 2 (hh)
		<i>(Skip 1' Equalizzazione on, se ore di carica compressive &lt; di Tskip)</i>	
		F9 - T.on Equalization	10 (min)
		F9 - Vlim Equalization	<input type="radio"/> Off <input checked="" type="radio"/> 2,70 (V/el)
		F9 - Iref Equalization	6,6 (A) <input checked="" type="checkbox"/> Zero current contrast
		F10 - T.off Equalization	50 (min)
		F11 - Current Equalization Cycle T.	60 (ore)
		<i>(Time in hours of current equalization)</i>	
		F12 - Repeat Equal. Cycle pause T.	<input type="radio"/> Off <input checked="" type="radio"/> 120 (ore)
		<i>(Pause in hours for repeating current equalization)</i>	
		F8/F10/F11/F12-Vmin Equal. Restart	<input type="radio"/> Off <input checked="" type="radio"/> 2,05 (V/el)
		F13-Trickle charge	<input checked="" type="radio"/> Off <input type="radio"/> --- (hh) <input type="radio"/> ∞
		F13-Vref Trickle charge	--- (V/el)
		F13-Iref Trickle charge	<input checked="" type="radio"/> Off <input type="radio"/> --- (A) <input type="checkbox"/> Zero current contrast

**Phase Profile Parameters**

FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 12:34:21

**HF205 - PARAMETRI FASE CURVA ON LINE**

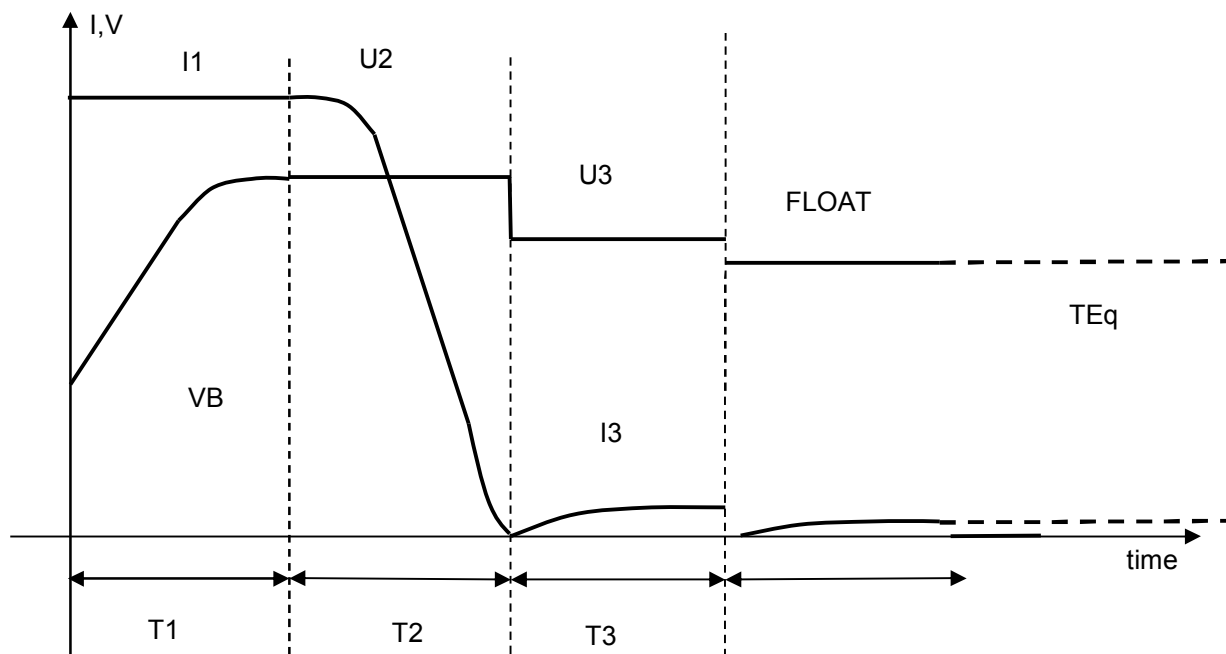
SERIAL NUMBER 0003      Customer \*\*\*\*      **Curva 3**      **ID: 3 PB GEL\_01 .0002**  
 Battery BATT01234567      Operator \*\*\*\*      **CYCLE NUMBER**      **2**

	START	PHASE 1	PHASE 2	PHASE 3	PHASE 4
Test		1-I-Direct Current	2-U-Constant	1-I-Direct Current	2-U-Constant
Vref (V/el)		0,00	2,35	0,00	2,65
Vmin (V/el)	1,00	0,00	0,00	1,98	1,98
Vmax (V/el)	2,30	2,35	0,00	2,65	0,00
Iref (A)		80,0	0,0	6,6	6,6
Imin (A)	0,0	0,0	6,6	0,0	0,0
Imax (A)	0,0	0,0	85,7	0,0	0,0
Tref (h:m:s)	0:00:05	8:00:00	4:00:00	3:30:00	0:30:00
TbRef (NTC)	°C	°C	°C	°C	°C
Condit1	14-T>=Tref	4-V>=Vmax	7-I<Imin	4-V>=Vmax	0-OFF
Next C1	1-FASE1	2-FASE2	3-FASE3	4-FASE4	14-T>=Tref
Condit2	0-OFF	0-OFF	14-T>=Tref	8-PAUSA	8-PAUSA
Next C2			3-FASE3	0-OFF	0-OFF
Condit3	0-OFF	0-OFF	10-I>=Imax	19-dVdT<dVTF	0-OFF
Next C3			1-FASE1	8-PAUSA	0-OFF
Condit4	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
Next C4					
Condit5	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
Next C5					
Condit6	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
Next C6					
Cond. ALL 1	0-OFF	14-T>=Tref	0-OFF	1-V<Vmin	1-V<Vmin
Next Call1		15-AL.STOP		15-AL.STOP	15-AL.STOP
Cond. ALL 2	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
Next Call2					
Zero current		<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off
SpecFunc1	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc2	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc3	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc4	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc5	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc6	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc7	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc8	0-OFF	0-OFF	0-OFF	0-OFF	0-OFF



## 4) Profile AGM ODISSEY IUoUaU

<b>Profile</b>	IUUaUo AGM ODISSEY 25 ÷ 62,5A/100Ah
<b>ID</b>	4-OD AGM_01.0002
<b>Release</b>	rev 1.0002
<b>Date</b>	08/05/2012



### Time Table

T1	T2	T3	T4	Tp	Tfloat		
8h (Sic)	10h	2h		0	∞		

### Voltage Table

U1	U2	U3	U4		Ufloat		
2,45 (threshold)	2,45 cost	2,27 cost			2,20 cost		

### Current Table

I1	I2	I3	I4		Ifloat		
25 ÷ 62,5 A/100Ah	1/6 * I1 (threshold)	1/6 * I1 cost			1/6 * I1 max		

**Fixed Profile Parameters**

<b>HF205 - SET CURVE PARAMETERS 1 - 8 ON LINE</b>		FW: Main:b2.37-14.10.2011 - SW: V: 1.9 Print Date Time 08/05/2012 13:48:44																																																														
SERIAL NUMBER 0003 Battery BATT01234567 Customer ***** Operator *****	<b>Curva 4</b> <b>CYCLE NUMBER</b>	<b>4 OD AGM_01 .0002</b> <b>2</b>																																																														
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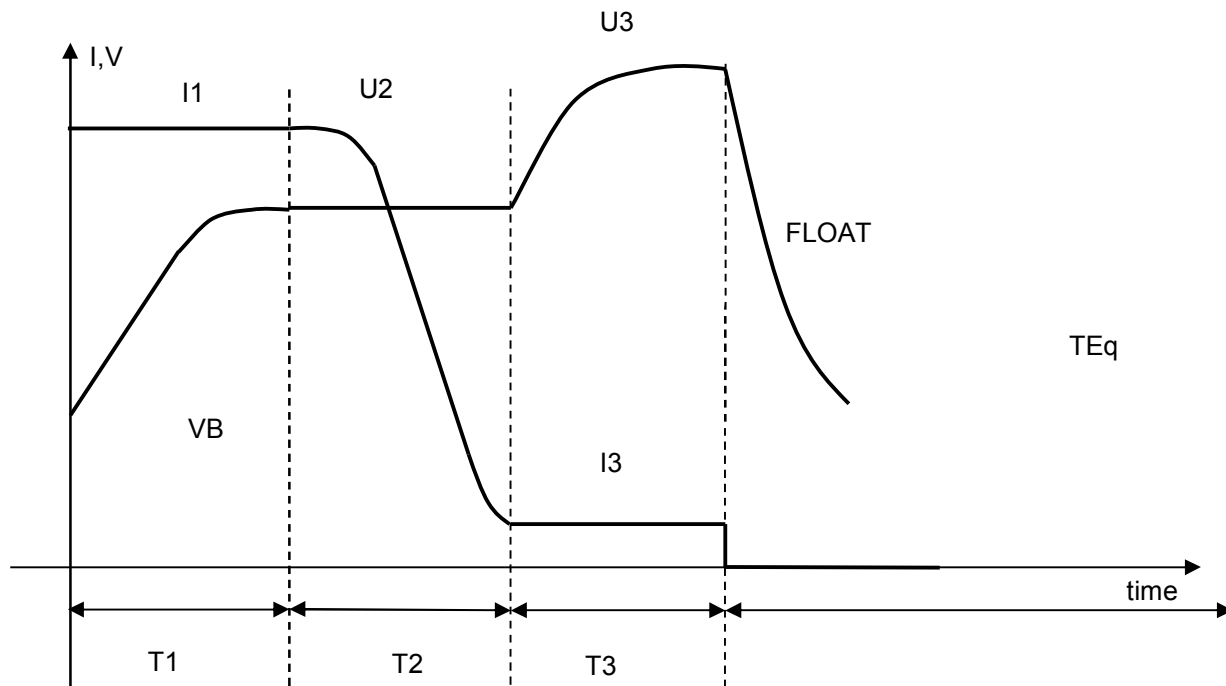
**Phase Profile Parameters**

<b>HF205 - PARAMETRI FASE CURVA ON LINE</b>		FW: Main:b2.37-14.10.2011 - SW: V: 1.9 Print Date Time 08/05/2012 13:49:52																																																																																																																																																																										
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Imin (A)	0,0	0,0	13,4	0,0																																																																																																																																																																								
Imax (A)	0,0	0,0	85,7	0,0																																																																																																																																																																								
Tref (h:m:s)	0:00:05	8:00:00	10:00:00	2:00:00																																																																																																																																																																								
TbRef (NTC)		°C	°C	°C																																																																																																																																																																								
Condit1	14-T>=Tref	4-V>=Vmax	7-I<Imin	0-OFF																																																																																																																																																																								
Next C1	1-FASE1	2-FASE2	3-FASE3																																																																																																																																																																									
Condit2	0-OFF	0-OFF	14-T>=Tref	14-T>=Tref																																																																																																																																																																								
Next C2			3-FASE3	8-PAUSA																																																																																																																																																																								
Condit3	0-OFF	0-OFF	10-I>=Imax	0-OFF																																																																																																																																																																								
Next C3			1-FASE1																																																																																																																																																																									
Condit4	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																								
Next C4																																																																																																																																																																												
Condit5	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																								
Next C5																																																																																																																																																																												
Condit6	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																								
Next C6																																																																																																																																																																												
Cond. ALL 1	0-OFF	14-T>=Tref	10-I>=Imax	1-V<Vmin																																																																																																																																																																								
Next Call1		15-AL.STOP	15-AL.STOP	15-AL.STOP																																																																																																																																																																								
Cond. ALL 2	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																								
Next Call2																																																																																																																																																																												
Zero current		<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off																																																																																																																																																																								
SpecFunc1	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																								
SpecFunc2	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																								
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SpecFunc7	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																								
SpecFunc8	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																								



## 5) Profile AGM IU1a

<b>Profile</b>	IU1a AGM
<b>ID</b>	5 AG IUI_01.0002
<b>Release</b>	rev 1.0002
<b>Date</b>	08/05/2012



### Time Table

T1	T2	T3	T4	Tp	Tfloat		
4h (Sic)	6h	6h		0			

### Voltage Table

U1	U2	U3	U4		Ufloat		
2,45 (threshold)	2,45 cost	2,70 max					

### Current Table

I1	I2	I3	I4		Ifloat		
Inom	1/17 * I1 (threshold)	1/17 * I1 cost					



**Fixed Profile Parameters**

**HF205 - SET CURVE PARAMETERS 1 - 8 ON LINE**

FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 14:13:45

SERIAL NUMBER 0003  
Battery BATT01234567  
Customer \*\*\*\*\*  
Operator \*\*\*\*\*

Curva 5 5 AG IUI\_01 .0002  
CYCLE NUMBER 2

Battery Voltage Parameters		Num current phases	
Type of Battery	0-Pb	3	
Element Rat. Volt.	2,00 (V)	F1/F7 - Timeout current charging	<input type="radio"/> Off <input checked="" type="radio"/> 16:00 (hh:mm) <input type="radio"/> P3
Max Control Volt.	2,70 (V/el)	TSIC Fault Signal	<input type="radio"/> Off <input checked="" type="radio"/> On
<input type="checkbox"/> Start without battery (F0 - F1)		Tprop	0-OFF
<input type="checkbox"/> Enable Rated Voltage Variation		Ahprop	0-OFF
Number Battery Elements	24	dVF	<input type="radio"/> Off <input checked="" type="radio"/> 5 / 36 (mVel / min)
Battery Rated Voltage	48 (V)	Reset due to power cut	<input type="radio"/> Off <input checked="" type="radio"/> On
Battery Current Parameters		F8 - PAUSE at charging end	0:00 (hh:mm)
<input type="checkbox"/> Enable Nominal Current Variation		F9/F12 - Equalization	<input checked="" type="radio"/> Off <input type="radio"/> --- (N/24h) <input type="radio"/> ∞
Nominal charging Current	80,0 (A)	F9 - Tskip Equalization on	<input checked="" type="radio"/> Off <input type="radio"/> --- (hh)
		<i>(Skip 1' Equalizzazione on, se ore di carica complessive &lt; di Tskip)</i>	
		F9 - T.on Equalization	10 (min)
		F9 - Vlim Equalization	<input type="radio"/> Off <input checked="" type="radio"/> 2,00 (V/el)
		F9 - Iref Equalization	6,6 (A) <input type="checkbox"/> Zero current contrast
		F10 - T.off Equalization	50 (min)
		F11 - Current Equalization Cycle T.	6 (ore)
		<i>(Time in hours of current equalization)</i>	
		F12 - Repeat Equal. Cycle pause T.	<input type="radio"/> Off <input checked="" type="radio"/> 72 (ore)
		<i>(Pause in hours for repeating current equalization)</i>	
		F8/F10/F11/F12-Vmin Equal. Restart	<input type="radio"/> Off <input checked="" type="radio"/> 2,00 (V/el)
		F13-Trickle charge	<input checked="" type="radio"/> Off <input type="radio"/> --- (hh) <input type="radio"/> ∞
		F13-Vref Trickle charge	2,00 (V/el)
		F13-Iref Trickle charge	<input type="radio"/> Off <input checked="" type="radio"/> 22,9 (A) <input type="checkbox"/> Zero current contrast

**Phase Profile Parameters**

**HF205 - PARAMETRI FASE CURVA ON LINE**

FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 14:15:07

SERIAL NUMBER 0003 Customer \*\*\*\*\*  
Battery BATT01234567 Operator \*\*\*\*\*

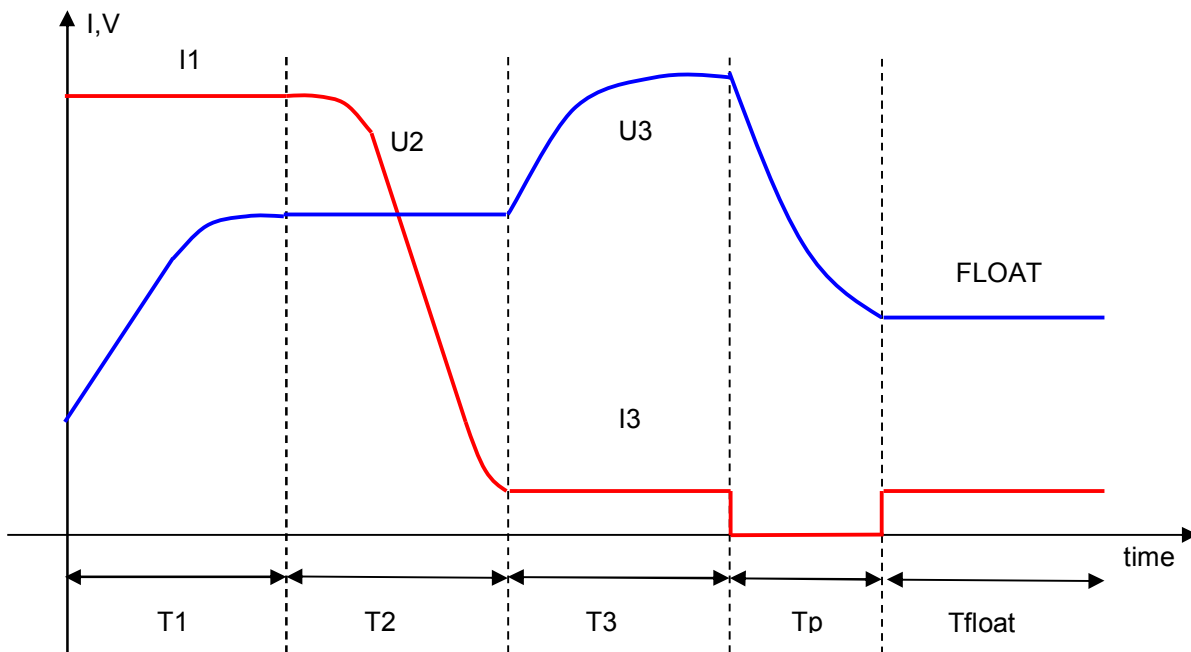
Curva 5 ID: 5 AG IUI\_01 .0002  
CYCLE NUMBER 2

	START	PHASE 1	PHASE 2	PHASE 3
Test		1-I-Direct Current	2-U-Constant	1-I-Direct Current
Vref (V/el)		0,00	2,45	0,00
Vmin (V/el)	1,00	0,00	0,00	1,98
Vmax (V/el)	2,30	2,45	0,00	2,70
Iref (A)		80,0	0,0	4,6
Imin (A)	0,0	0,0	4,6	0,0
Imax (A)	0,0	0,0	88,0	0,0
Tref (h:m:s)	0:00:05	4:00:00	6:00:00	6:00:00
TbRef (NTC)		°C	°C	°C
Condit1	14-T>=Tref	4-V>=Vmax	7-I<Imin	4-V>=Vmax
Next C1	1-FASE1	2-FASE2	3-FASE3	8-PAUSA
Condit2	0-OFF	14-T>=Tref	14-T>=Tref	14-T>=Tref
Next C2		2-FASE2	3-FASE3	8-PAUSA
Condit3	0-OFF	0-OFF	0-OFF	19-dVdT<dVTF
Next C3				8-PAUSA
Condit4	0-OFF	0-OFF	0-OFF	0-OFF
Next C4				
Condit5	0-OFF	0-OFF	0-OFF	0-OFF
Next C5				
Condit6	0-OFF	0-OFF	0-OFF	0-OFF
Next C6				
Cond. ALL 1	0-OFF	0-OFF	10-I>=Imax	1-V<Vmin
Next Call1			15-AL.STOP	15-AL.STOP
Cond. ALL 2	0-OFF	0-OFF	0-OFF	0-OFF
Next Call2				
Zero current		<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off
SpecFunc1	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc2	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc3	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc4	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc5	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc6	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc7	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc8	0-OFF	0-OFF	0-OFF	0-OFF



## 6) Profile AGM DISCOVER

<b>Profile</b>	AGM DISCOVER
<b>ID</b>	6 AG DIS_01.0001
<b>Release</b>	rev 1.0001
<b>Date</b>	28/01/2016



Time Table

T1	T2	T3	Tp	Tfloat
10h (Sicurezza)	5h (Sicurezza)	4h (Max)	1h	∞

Voltage Table

U1	U2	U3	Ufloat
2,47	2,47 cost	2,6 max	2,27 cost

Current Table

I1	I2	I3	I float
Inom	1/16 * I1 (regolabili)	1/16 * I1 cost	1/16 * I1 (max)

**Fixed Profile Parameters**

<b>HF205 - PARAMETRI FISSI CURVE 1 - 8 ON LINE</b>		FW: Main:b3.08-06.07.2015 - SW: V: 3.56 Data Ora Stampa 28/01/16 14:43:24																																																																																		
MATRICOLA YR0666	Batteria BATT01234567	<b>Curva 6</b> <b>CICLO NUMERO</b> 29																																																																																		
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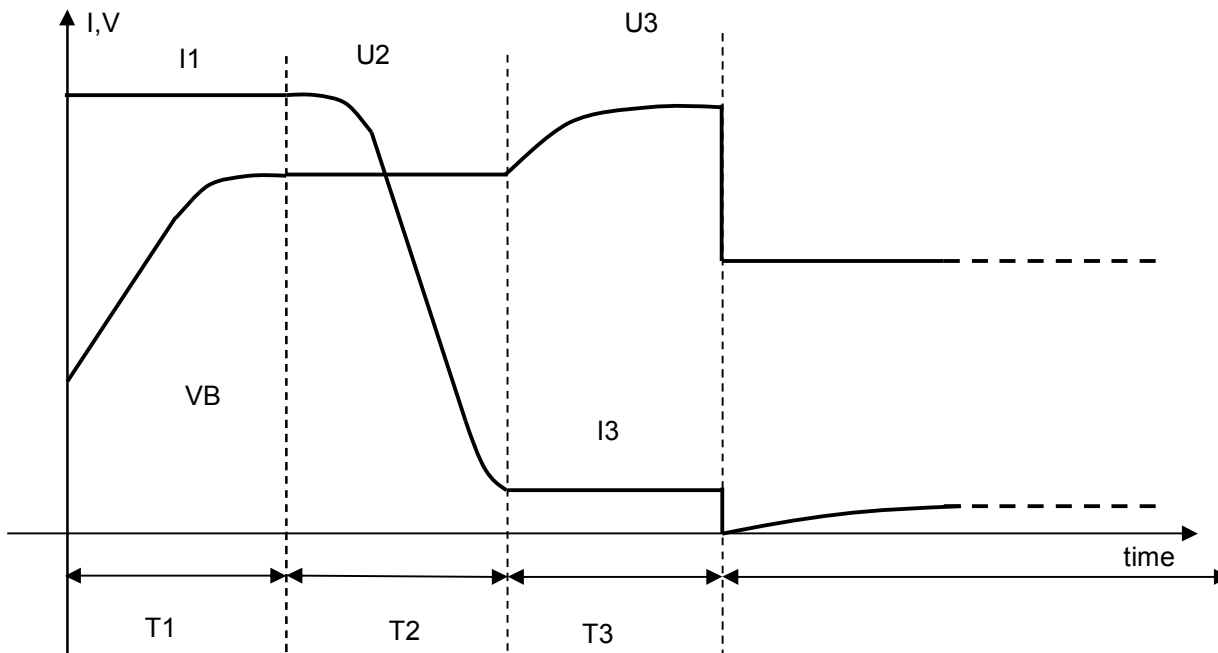
**Phase Profile Parameters**

<b>HF205 - PARAMETRI FASE CURVA ON LINE</b>		FW: Main:b3.08-06.07.2015 - SW: V: 3.56 Data Ora Stampa 28/01/16 14:39:54																																																																																																																																																																															
MATRICOLA YR0666	Batteria BATT01234567	<b>Curva 6</b> <b>CICLO NUMERO</b> 29																																																																																																																																																																															
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	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>START</th> <th>FASE 1</th> <th>FASE 2</th> <th>FASE 3</th> </tr> </thead> <tbody> <tr> <td>Controllo</td> <td></td> <td>1-I-Cor. Cost</td> <td>2-U-Tens. Cost</td> <td>1-I-Cor. Cost</td> </tr> <tr> <td>Vref (V/el)</td> <td></td> <td>0,00</td> <td>2,47</td> <td>0,00</td> </tr> <tr> <td>Vmin (V/el)</td> <td>1,00</td> <td>0,00</td> <td>0,00</td> <td>1,98</td> </tr> <tr> <td>Vmax (V/el)</td> <td>2,30</td> <td>2,47</td> <td>0,00</td> <td>2,60</td> </tr> <tr> <td>Iref (A)</td> <td></td> <td>100,0</td> <td>0,0</td> <td>16,0</td> </tr> <tr> <td>Imin (A)</td> <td>0,0</td> <td>0,0</td> <td>16,0</td> <td>0,0</td> </tr> <tr> <td>Imax (A)</td> <td>0,0</td> <td>0,0</td> <td>107,0</td> <td>0,0</td> </tr> <tr> <td>Tref (h.m.s)</td> <td>0:00:05</td> <td>10:00:00</td> <td>5:00:00</td> <td>4:00:00</td> </tr> <tr> <td>TbRef (NTC)</td> <td>°C</td> <td>°C</td> <td>°C</td> <td>°C</td> </tr> <tr> <td>Condiz1</td> <td>14-T&gt;=Tref</td> <td>4-V&gt;=Vmax</td> <td>7-I&lt;Imin</td> <td>4-V&gt;=Vmax</td> </tr> <tr> <td>Next C1</td> <td>1-FASE1</td> <td>2-FASE2</td> <td>3-FASE3</td> <td>8-PAUSA</td> </tr> <tr> <td>Condiz2</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>14-T&gt;=Tref</td> </tr> <tr> <td>Next C2</td> <td></td> <td></td> <td></td> <td>8-PAUSA</td> </tr> <tr> <td>Condiz3</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>Next C3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Condiz4</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>Next C4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Condiz5</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>Next C5</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Condiz6</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>Next C6</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Cond. ALL 1</td> <td>0-OFF</td> <td>14-T&gt;=Tref</td> <td>14-T&gt;=Tref</td> <td>0-OFF</td> </tr> <tr> <td>Next Call1</td> <td></td> <td>15-AL.STOP</td> <td>15-AL.STOP</td> <td></td> </tr> <tr> <td>Cond. ALL 2</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>Next Call2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Corrente zero</td> <td></td> <td><input checked="" type="radio"/> On <input type="radio"/> Off</td> <td><input checked="" type="radio"/> On <input type="radio"/> Off</td> <td><input checked="" type="radio"/> On <input type="radio"/> Off</td> </tr> <tr> <td>FunzSpec1</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>FunzSpec2</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>FunzSpec3</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>FunzSpec4</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>FunzSpec5</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>FunzSpec6</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>FunzSpec7</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> <tr> <td>FunzSpec8</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> <td>0-OFF</td> </tr> </tbody> </table>		START	FASE 1	FASE 2	FASE 3	Controllo		1-I-Cor. Cost	2-U-Tens. Cost	1-I-Cor. Cost	Vref (V/el)		0,00	2,47	0,00	Vmin (V/el)	1,00	0,00	0,00	1,98	Vmax (V/el)	2,30	2,47	0,00	2,60	Iref (A)		100,0	0,0	16,0	Imin (A)	0,0	0,0	16,0	0,0	Imax (A)	0,0	0,0	107,0	0,0	Tref (h.m.s)	0:00:05	10:00:00	5:00:00	4:00:00	TbRef (NTC)	°C	°C	°C	°C	Condiz1	14-T>=Tref	4-V>=Vmax	7-I<Imin	4-V>=Vmax	Next C1	1-FASE1	2-FASE2	3-FASE3	8-PAUSA	Condiz2	0-OFF	0-OFF	0-OFF	14-T>=Tref	Next C2				8-PAUSA	Condiz3	0-OFF	0-OFF	0-OFF	0-OFF	Next C3					Condiz4	0-OFF	0-OFF	0-OFF	0-OFF	Next C4					Condiz5	0-OFF	0-OFF	0-OFF	0-OFF	Next C5					Condiz6	0-OFF	0-OFF	0-OFF	0-OFF	Next C6					Cond. ALL 1	0-OFF	14-T>=Tref	14-T>=Tref	0-OFF	Next Call1		15-AL.STOP	15-AL.STOP		Cond. ALL 2	0-OFF	0-OFF	0-OFF	0-OFF	Next Call2					Corrente zero		<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	FunzSpec1	0-OFF	0-OFF	0-OFF	0-OFF	FunzSpec2	0-OFF	0-OFF	0-OFF	0-OFF	FunzSpec3	0-OFF	0-OFF	0-OFF	0-OFF	FunzSpec4	0-OFF	0-OFF	0-OFF	0-OFF	FunzSpec5	0-OFF	0-OFF	0-OFF	0-OFF	FunzSpec6	0-OFF	0-OFF	0-OFF	0-OFF	FunzSpec7	0-OFF	0-OFF	0-OFF	0-OFF	FunzSpec8	0-OFF	0-OFF	0-OFF	0-OFF	
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Condiz2	0-OFF	0-OFF	0-OFF	14-T>=Tref																																																																																																																																																																													
Next C2				8-PAUSA																																																																																																																																																																													
Condiz3	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																													
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Condiz5	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																													
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Condiz6	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																													
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Cond. ALL 1	0-OFF	14-T>=Tref	14-T>=Tref	0-OFF																																																																																																																																																																													
Next Call1		15-AL.STOP	15-AL.STOP																																																																																																																																																																														
Cond. ALL 2	0-OFF	0-OFF	0-OFF	0-OFF																																																																																																																																																																													
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## 7) Profile AGM IU1a

<b>Profile</b>	IU1aUo AGM I = C5 / 4
<b>ID</b>	7 AG FRO_01.0001
<b>Release</b>	rev 1.0002
<b>Date</b>	08/05/2012



### Time Table

T1	T2	T3	T4	Tp	Tfloat		
4h (Sic)	6h	3,5h		0	∞		

### Voltage Table

U1	U2	U3	U4		Ufloat		
2,35 (threshold)	2,35 cost	2,45 max			2,27 cost		

### Current Table

I1	I2	I3	I4		Ifloat		
C5 / 4	1/16,7 * I1 (threshold)	1/16.7 * I1 cost			1/14 * I1		

**Fixed Profile Parameters**

**HF205 - SET CURVE PARAMETERS 1 - 8 ON LINE**

FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 14:41:04

SERIAL NUMBER 0003  
Battery BATT01234567  
Customer \*\*\*\*\*  
Operator \*\*\*\*\*

Curva 7  
CYCLE NUMBER 2  
7 AG FRO\_01 .0001

Battery Voltage Parameters	
Type of Battery	0-Pb
Element Rat. Volt.	2,00 (V)
Max Control Volt.	2,50 (V/el)
<input type="checkbox"/> Start without battery (F0 - F1)	
<input type="checkbox"/> Enable Rated Voltage Variation	
Number Battery Elements	24
Battery Rated Voltage	48 (V)

Battery Current Parameters	
<input type="checkbox"/> Enable Nominal Current Variation	
Nominal charging Current	80,0 (A)

Num current phases	3		
F1/F7 - Timeout current charging	<input type="radio"/> Off <input checked="" type="radio"/> On	14:00 (hh:mm)	<input type="radio"/> P3
TSIC Fault Signal	<input type="radio"/> Off <input checked="" type="radio"/> On		
Tprop	0-OFF		
Ahprop	0-OFF		
dVf	<input type="radio"/> Off <input checked="" type="radio"/> On	5 / 36 (mV/el / min)	
Reset due to power cut	<input type="radio"/> Off <input checked="" type="radio"/> On		
F8 - PAUSE at charging end	0:00 (hh:mm)		
F9/F12 - Equalization	<input checked="" type="radio"/> Off <input type="radio"/> On	--- (N/24h)	<input type="radio"/> ∞
F9 - Tskip Equalization on	<input checked="" type="radio"/> Off <input type="radio"/> On	--- (hh)	
<i>(Skip 1' Equalizzazione on, se ore di carica complessive &lt; di Tskip)</i>			
F9 - T.on Equalization	55 (min)		
F9 - Vlim Equalization	<input type="radio"/> Off <input checked="" type="radio"/> On	2,00 (V/el)	
F9 - Iref Equalization	5,3 (A) <input type="checkbox"/> Zero current contrast		
F10 - T.off Equalization	5 (min)		
F11 - Current Equalization Cycle T.	24 (ore)		
<i>(Time in hours of current equalization)</i>			
F12 - Repeat Equal. Cycle pause T.	<input type="radio"/> Off <input checked="" type="radio"/> On	24 (ore)	
<i>(Pause in hours for repeating current equalization)</i>			
F8/F10/F11/F12-Vmin Equal. Restart	<input type="radio"/> Off <input checked="" type="radio"/> On	2,00 (V/el)	
F13-Trickle charge	<input type="radio"/> Off <input type="radio"/> On	(hh)	<input checked="" type="radio"/> ∞
F13-Vref Trickle charge	2,27 (V/el)		
F13-Iref Trickle charge	<input type="radio"/> Off <input checked="" type="radio"/> On	5,7 (A)	<input checked="" type="checkbox"/> Zero current contrast

**Phase Profile Parameters**

**HF205 - PARAMETRI FASE CURVA ON LINE**

FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 14:41:53

SERIAL NUMBER 0003  
Battery BATT01234567

Customer \*\*\*\*\*  
Operator \*\*\*\*\*

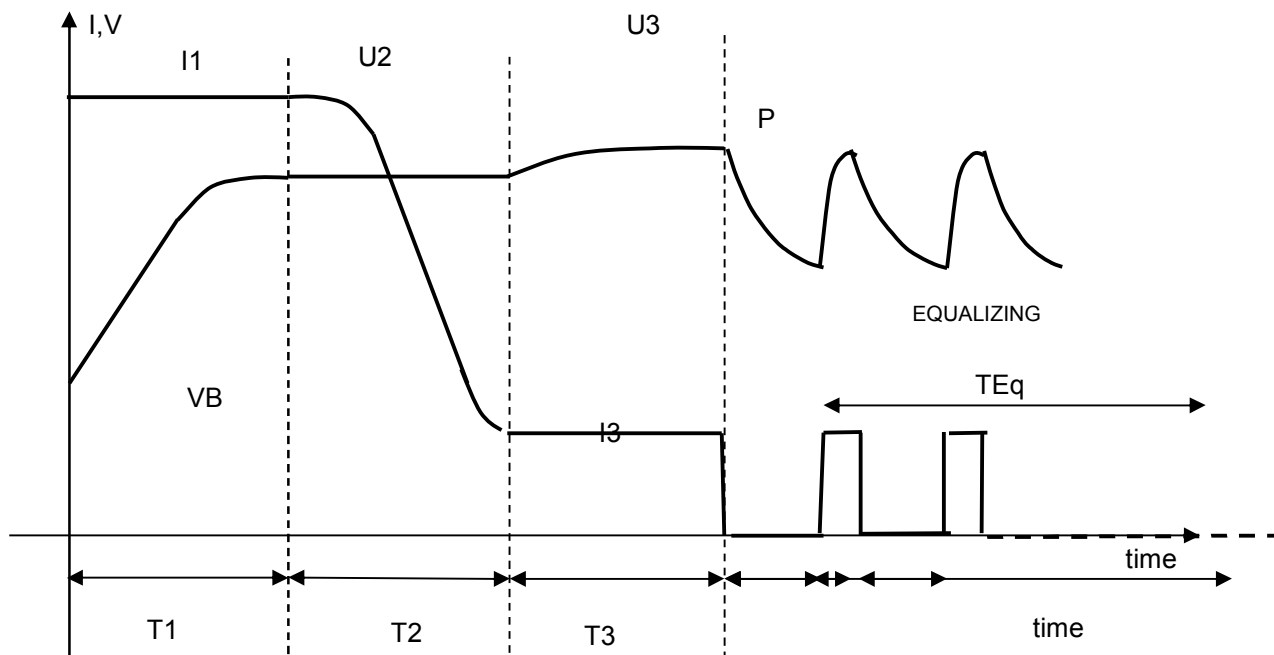
Curva 7  
CYCLE NUMBER 2  
ID: 7 AG FRO\_01 .0001

	START	PHASE 1	PHASE 2	PHASE 3
Test		1-I-Direct Current	2-U-Constant	1-I-Direct Current
Vref (V/el)		0,00	2,35	0,00
Vmin (V/el)	1,00	0,00	0,00	1,98
Vmax (V/el)	2,30	2,35	0,00	2,45
Iref (A)		80,0	0,0	4,8
Imin (A)	0,0	0,0	4,8	0,0
Imax (A)	0,0	0,0	85,7	0,0
Tref (hm:s)	0:00:05	4:00:00	6:00:00	3:30:00
TbRef (NTC)		°C	°C	°C
Condit1	14-T>=Tref	4-V>=Vmax	7-I<Imin	4-V>=Vmax
Next C1	1-FASE1	2-FASE2	3-FASE3	8-PAUSA
Condit2	0-OFF	14-T>=Tref	14-T>=Tref	14-T>=Tref
Next C2		2-FASE2	3-FASE3	8-PAUSA
Condit3	0-OFF	0-OFF	0-OFF	19-dVdT<dVTF
Next C3				8-PAUSA
Condit4	0-OFF	0-OFF	0-OFF	0-OFF
Next C4				
Condit5	0-OFF	0-OFF	0-OFF	0-OFF
Next C5				
Condit6	0-OFF	0-OFF	0-OFF	0-OFF
Next C6				
Cond. ALL 1	0-OFF	0-OFF	10-I>=Imax	1-V<Vmin
Next Call1			15-AL.STOP	15-AL.STOP
Cond. ALL 2	0-OFF	0-OFF	0-OFF	0-OFF
Next Call2				
Zero current		<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off
SpecFunc1	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc2	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc3	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc4	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc5	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc6	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc7	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc8	0-OFF	0-OFF	0-OFF	0-OFF



# 8) Profile PB LM IUo

<b>Profile</b>	Pb LM IUo
<b>ID</b>	8 PB LM_01.0001
<b>Release</b>	rev 1.0002
<b>Date</b>	08/05/2012



**Time Table**

T1	T2	T3	T4	Tp	TeOn	TeOff	TEq
7h (Sic)	4h	1h		1	10min	50min	6h

**Voltage Table**

U1	U2	U3	U4	Up	Ueon	Uemin	
2,38 (threshold)	2,38 cost	2,42 max		Free	2,45 max	2,05 min	

**Current Table**

I1	I2	I3	I4	Ip	leon	leoff	
Inom	1/12,3 * I1 (threshold)	1/12,3 * I1 cost		0	1/12,3 * I1 cost	0	



**Fixed Profile Parameters**

**HF205 - SET CURVE PARAMETERS 1 - 8 ON LINE** FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 14:57:52

SERIAL NUMBER 0003 **Curva 8**  
 Battery BATT01234567 **8 PB LM \_01 .0001**  
 Customer \*\*\*\*\* **CYCLE NUMBER**  
 Operator \*\*\*\*\* **2**

Battery Voltage Parameters		Num current phases	
Type of Battery	0-Pb	3	
Element Rat. Volt.	2,00 (V)	F1/F7 - Timeout current charging	<input type="radio"/> Off <input checked="" type="radio"/> 12:00 (hh:mm) <input type="radio"/> P3
Max Control Volt.	2,80 (V/el)	TSIC Fault Signal	<input type="radio"/> Off <input checked="" type="radio"/> On
<input type="checkbox"/> Start without battery (F0 - F1)		Tprop	0-OFF
<input type="checkbox"/> Enable Rated Voltage Variation		Ahprop	0-OFF
Number Battery Elements	24	dVF	<input type="radio"/> Off <input checked="" type="radio"/> 15 / 30 (mVel / min)
Battery Rated Voltage	48 (V)	Reset due to power cut	<input type="radio"/> Off <input checked="" type="radio"/> On
Battery Current Parameters		F8 - PAUSE at charging end	1:00 (hh:mm)
<input type="checkbox"/> Enable Nominal Current Variation		F9/F12 - Equalization	<input type="radio"/> Off <input checked="" type="radio"/> 6 (N/24h) <input type="radio"/> ∞
Nominal charging Current	80,0 (A)	F9 - Tskip Equalization on	<input type="radio"/> Off <input checked="" type="radio"/> 2 (hh)
		<i>(Skip 1' Equalizzazione on, se ore di carica complessive &lt; di Tskip)</i>	
		F9 - T.on Equalization	5 (min)
		F9 - Vlim Equalization	<input type="radio"/> Off <input checked="" type="radio"/> 2,45 (V/el)
		F9 - Iref Equalization	6,4 (A) <input checked="" type="checkbox"/> Zero current contrast
		F10 - T.off Equalization	55 (min)
		F11 - Current Equalization Cycle T.	60 (ore)
		<i>(Time in hours of current equalization)</i>	
		F12 - Repeat Equal. Cycle pause T.	<input type="radio"/> Off <input checked="" type="radio"/> 120 (ore)
		<i>(Pause in hours for repeating current equalization)</i>	
		F8/F10/F11/F12-Vmin Equal. Restart	<input type="radio"/> Off <input checked="" type="radio"/> 2,05 (V/el)
		F13-Trickle charge	<input checked="" type="radio"/> Off <input type="radio"/> --- (hh) <input type="radio"/> ∞
		F13-Vref Trickle charge	--- (V/el)
		F13-Iref Trickle charge	<input checked="" type="radio"/> Off <input type="radio"/> --- (A) <input type="checkbox"/> Zero current contrast

**Phase Profile Parameters**

**HF205 - PARAMETRI FASE CURVA ON LINE** FW: Main:b2.37-14.10.2011 - SW: V: 1.9  
Print Date Time 08/05/2012 14:58:37



SERIAL NUMBER 0003 **Curva 8**  
 Battery BATT01234567 **ID: 8 PB LM \_01 .0001**  
 Customer \*\*\*\*\* **CYCLE NUMBER**  
 Operator \*\*\*\*\* **2**

	START	PHASE 1	PHASE 2	PHASE 3
Test		1-I-Direct Current	2-U-Constant	1-I-Direct Current
Vref (V/el)		0,00	2,38	0,00
Vmin (V/el)	1,00	0,00	0,00	1,90
Vmax (V/el)	2,30	2,38	0,00	2,42
Iref (A)		80,0	0,0	6,5
Imin (A)	0,0	0,0	6,5	0,0
Imax (A)	0,0	0,0	85,7	0,0
Tref (h:m:s)	0:00:05	7:00:00	3:59:59	1:00:00
TbRef (NTC)		°C	°C	°C
Condit1	14-T>=Tref	4-V>=Vmax	7-I<Imin	0-OFF
Next C1	1-FASE1	2-FASE2	3-FASE3	
Condit2	0-OFF	0-OFF	14-T>=Tref	14-T>=Tref
Next C2			3-FASE3	8-PAUSA
Condit3	0-OFF	0-OFF	0-OFF	19-dVdT<dVTF
Next C3				8-PAUSA
Condit4	0-OFF	0-OFF	0-OFF	0-OFF
Next C4				
Condit5	0-OFF	0-OFF	0-OFF	0-OFF
Next C5				
Condit6	0-OFF	0-OFF	0-OFF	0-OFF
Next C6				
Cond. ALL 1	0-OFF	14-T>=Tref	10-I>=Imax	1-V<Vmin
Next Call1		15-AL.STOP	15-AL.STOP	15-AL.STOP
Cond. ALL 2	0-OFF	0-OFF	0-OFF	0-OFF
Next Call2				
Zero current		<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off	<input checked="" type="radio"/> On <input type="radio"/> Off
SpecFunc1	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc2	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc3	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc4	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc5	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc6	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc7	0-OFF	0-OFF	0-OFF	0-OFF
SpecFunc8	0-OFF	0-OFF	0-OFF	0-OFF



**CE DECLARATION OF CONFORMITY**

file: CE Declaration-HF9-rev0-27 07 2015.doc

**DECLARATION OF CONFORMITY**

We

**PBM S.r.l.**  
**Via Barella – Zona Industriale**  
**41058 Vignola (MO), Italy**  
**Tel.: + 39 059 7705311**  
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declare under our sole responsibility that the following product  
**Product type: BATTERY CHARGER**  
**Name: HF9**  
**Models: ALL**  
**Options: ALL**

to which this declaration relates complies with the requirements of the following Directives of the European Union:


**2006/95/EEC (LVD)** and following modifications  
 and  
**2004/108/EEC (EMC)** and following modifications

Standards to which conformity is declared:

**Safety:** CEI EN60335-1:( 2008)  
**EMC:** CEI EN61000-6-2 :(2006)  
 CEI EN61000-6-4 :( 2007)  
 CEI EN50366 : (02-2004)  
 including amendments

**Date of issue:**  
 10/07/2015  
 Place of issue:  
 VIGNOLA

**P.B.M. S.r.l.**  
**Lino Pelloni**  
 President



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