Bauer Daten-Systeme GmbH

Entwicklung
und Fertigung
elektronischer Systeme

Akkuprüf- und Ladegerät

curatio® APL-4

Power für jeden Akku

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Laden · Entladen · Kapazitätsmessung

Verlängerung der Lebensdauer · Kostensenkung

Erhöhung der Betriebssicherheit · Ermitteln des Zustands · Regenerieren

The Battery Tester and Charger *curatio*® APL-4 offers:

Simultaneous, microprocessor-controlled discharge / charge of **four** different battery blocks.

Battery connection through 4mm safety plugs with program memory in APL-4 or

Battery connection through 15-pin plug with external program memory for charging and discharging currents, number of cells, battery capacity, etc. The program stored in the plug of the adapter is automatically activated by connecting the adapter to the APL-4 and plugging-in the batteries into the adapter.

It is not necessary to perform a manual change in the program when changing batteries. A different adapter is offered for each type of battery. The battery adapters are supplied with preset charging parameters. The programming can be blocked to prevent errors of operation.

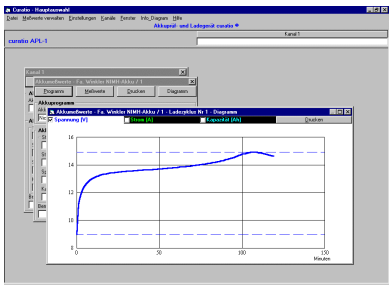
Simple Changes to the charging program through pressing four keys and German-language Help menu in the display screen. Set values remain so, even when the appliance has been shut off.

Changeable **Cycles** for the batteries: Charge Only; Discharge Only; Discharge – Charge; Charge - Discharge – Charge; conditioning (= repetitive charging-discharging-charging automatically until the max. battery capacity has been reached in choosable cycles 2 to 6); Charge – Discharge – Charge with settable repeated Discharge – Charge after 1 to 30 days.

Serial Interface – The battery data can be printed out directly in label or table format.

```
****  bds GmbH      curatio    ****
Mode  13
Battery No. _________ Date _________
Discharge  0.500A  1.425Ah   4.499V
Charge     1.500A  1.805Ah   6.889V
Mode ended      Battery ok
 95% of  1.500Ah  Nominal capacity
```

***curatio*WIN-III** - PC-Software for Windows to illustrate the discharging- and charging curves of the batteries. Programming of the APL-4 using the PC-Software. Management of the values with a Database function. Using a **Network version**, multiple APL-4s can be controlled through one PC.



By way of **Forming** i.e. regeneration, in which the battery is charged and discharged repeatedly, battery cells suffering from loss of capacity can be returned to higher capacity.

Mode for **manual settings** of the End-Of-Discharge and End-Of-Charge Voltage.

Capacity measurement for both charge and discharge of rechargeable batteries.
Display of the battery data on a large, illuminated 2 x 16 character LCD.
Determination of the condition of the battery through the measured capacity and through the voltage curve.
Measurement of the **self-discharge** of a battery block within a programmable period of time.
A special **charge procedure**, tailored to the particular battery, is used for every type of battery, in which the charging process reliably switches off when "End-of-Charge" is reached. This insures that an overload, or equally a deep discharge, will be avoided. For Nickel-Cadmium-Cells and Nickel-Metal-Hydride-Cells the charge completion is determined using the -Delta/U method (i.e. when the battery is fully charged, the cell voltage drops slightly. The dropping in cell voltage indicates charge completion). For all other types of batteries the charge completion is indicated by reaching the End-of-Charge Voltage.
Rapid Charge Batteries can be charged quickly.

Technical Data	***curatio* APL-4**
Mains power	85 - 264V, 47 – 63 Hz, 200VA, PFC
Battery connection	via 4mm safety plugs or through a 15-pin Sub-D-Plug, reverse battery protection
Battery types / No. of cells	Nickel-Cadmium-Batteries 1 - 12 cells Nickel-Metal-Hydride-Batteries 1 - 12 cells Lithium-Ion-Batteries 1 - 5 cells Plump Batteries 1 - 9 cells
Display / Operation	Large, illuminated LCD with 2 x 16 characters LEDs for „Discharge / Charge“ and „Program End / Battery Defect“ Operation with 4 keys, Help menu in the display (changeable German/English)
Charge-/discharge currents	Total charging- and discharging current **8.0A**. Charging- and discharging current can be individually set for every channel from between 10mA to 2.0A, adjustable at 5 mA intervals.
Interface	RS 232, 9600 bps, 9-pin D-connector
Max. charging voltage	22.0V
Dimensions	350 mm W x 270 mm D x 110 mm H
Weight	5.9 kg
curatio ®	Latin = Maintenance, care

The Nickel-Cadmium-Batteries and the Nickel-Metal-Hydride-Batteries are charged using the **"Reverse Pulse Charging System"** in order to reduce Memory Effects. This charging procedure works against the formation of crystals in the batteries. The batteries need not be discharged before every recharge, which means a longer battery life.
After charging, a **Trickle Charge** is carried out. The battery blocks may remain connected to the *curatio* permanently.
Battery Adapter – Universal adapter and adapter made for particular types of batteries are available.

Special designs are possible by request.

Updated May 2001, Reserves the right to make changes

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Akkuprüf- und Ladegerät

curatio® APL-1

Wir nehmen jeden Akku unter Strom

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The Battery Tester and Charger *curatio*® APL-1 offers:

Microprocessor-controlled charging and discharging of **all** commonly used **types** of batteries.

Connection of the battery via 4mm plugs (this model holds the program memory inside the unit housing) or

Connection of the battery by use of a 15 pin connector. This connector holds an external program memory within the plug which controls the charging and discharging current, number of cells, type and capacity of the battery. The program automatically starts after connection of the charging adapter with a battery placed into it.

Thus, manual changes of the charging program are not required. Optionally, for each type of battery individual fitting battery adapters are available. These battery adapters are delivered along with a program fitting to the battery appropriate parameters. A protection against erroneous programming is provided as well.

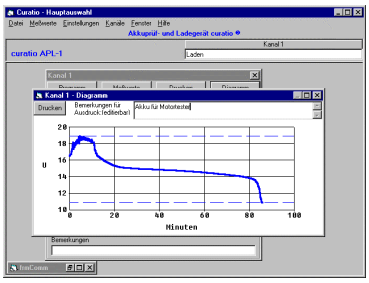
Simple modification of the battery program is possible by use of four push buttons and guidance text of a display. The battery program remains in the unit while powered off.

Program Modes selectable are: charging only, discharging only, discharge-charge, charge-discharge-charge, conditioning (= repetitive charging-discharging-charging automatically until the max. battery capacity has been reached in choosable cycles 2 to 6), charge-discharge-charge with repetitive discharge-charge after 1 to 30 days.

Serial Interface:
The battery data may be printed in table format or in a sticker format.

```
****  bds GmbH      curatio    ****
Mode  13
Batt.No. _________ Datum _________
Discharge 0,500A  1,425Ah    4,499V
Charge    1,500A  1,805Ah    6,889V
Mode ended        Batt. OK
 95% of  1,500Ah  Nominal capacity
```

***curatioWIN* II**
The Windows PC-Software displays the charging and the discharging curves of the battery. It allows programming of the APL-1 unit via the PC and handling of the data in database functions. Optionaly the *curatio*WIN II-N allows to attach multiple APL-1 to one PC.



Applying the **forming/regenerating mode** batteries may be charged/discharged several times, allowing batteries to be reconditioned to their maximal possible performance if they have suffered in capacity.

A programming mode is available allowing **freely manual selection** for unloading voltage and end of unloading cycle voltage.

The measurement of the **battery capacity** is provided after charging and after discharging.

The data of the battery are displayed by an **illuminated LCD-display** with 2 x 16 digits.

The **state of battery** is evaluated by the capacity and the voltage curve characteristic.

Measurement of the **self-unloading** characteristic may be done within a programmable period of time.

An **individual loading procedure** is provided for each type of battery, which controls a secure ending of the loading cycle and „shutting off“ after reaching the full capacity. An overloading and a deep unloading of the battery is safely inhibited. With Nickel-Cadmium-Battery and Nickel-Metal-Hydride-Battery the end of loading is detected by the delta/V method. (after the full capacity has been reached, the voltage of the battery decreases slightly, which is used for detection of end of loading). With other types of batteries the end of loading is detected after the maximum voltage has been reached.

Technical Data	***curatio* APL-1**
Main Power Supply	230V 50Hz 60VA, Option 115V/230V
Battery connection	via 4mm safety plugs or through a 15-pin Sub-D-Plug, reverse battery protection
Battery types / No. of cells	Nickel-Cadmium-Batteries 1 - 12 cells Nickel-Metall-Hydrid-Batteries 1 - 12 cells Lithium-Ionen-Batteries 1 - 4 cells Plump-Batteries 1 - 8 cells
Display / Operation	Backlight LCD-Display with 2 x 16 digits, LED signalling "End of Program", Operation by four pushbuttons, Menu-guided by display (german/english selectable)
Charge- / discharge current	Charge and Discharge current separatly selectable from 10mA up to 2,2A in steps of 5mA.
Interface	RS 232, 9600 bps, 9 Pin D-connector
Max. charging voltage	22,0Volts
Dimensions	205 mm B x 147 mm T x 80 mm H
Weight	1,8 kg
curatio ®	lateinisch = maintanance, care

The Nickel-Cadmium-Battery and Nickel-Metal-Hydride-Battery are loaded by a program called **„reversal pulse-loading“**. This charging program reduces the production of crystals within the batteries and enhances the battery lifetime.

After charging stand-by charging is performed. The battery may remain connected to the unit.

Battery Adapter – Universal adapter and adapter made for particular types of batteries are available.

Special designs are possible by request.
Updated May 2001, Reserves the right to make changes

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Bauer Daten-Systeme GmbH
Entwicklung und Fertigung
elektronischer Systeme

Akkuprüf- und Ladegerät

curatio® P4

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The Battery Tester and Charger *curatio*® P4 offers:

The *curatio* P4 is a microprocessor controlled battery-charger / discharger for connection of up to four rechargeable battery blocks. The battery blocks hooked can be charged or discharged independently of each other.

Easy operation of the instrument by four buttons. The parameter values are shown on a LCD display with 16 x 2 digits.

Individual charging processes can be used for each battery type with battery-dependend charging shut-off at a full battery. An over charging of the batteries, therefore, is inhibited, even if the batteries are connected permanently.

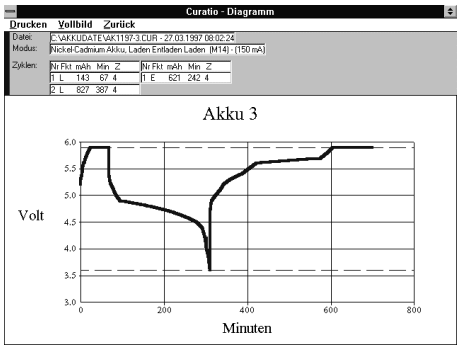
For each of the four channels the charging- and discharging current can be programmed individually. The current for each channel can be programmed in steps of 5 mA, starting at 20mA and 1300mA. The maximum current for all 4 channels is a total of 2,2A.

Throughout the process of charging or discharging the capacity of the battery is measured and is shown on the display. After complete charging of the battery the curatio P4 automatically changes over to stand-by charging.

The examined values of the connected batteries can be read out by curatio P4 serial interface. The battery data may be printed in formatted in table format or in a sticker format.

```
****  bds GmbH curatio  V.3.37 ****
Akku 1  Mode  13
Batt.No. _________ Date _________
Disharge  5,3V   3,6V
250mA   446mAh  4 Cells  114 min.
Charge     3,6V   5,8V
250mA   671mAh  4 Cells  194 min.
Mode ended
```

The PC-Software *curatio*WIN is a program allowing the data of a battery chaging / discharging process to record on a PC. The data will be displayed on the PC screen (charts or graphic) and may be printed as well.



curatio P4 is designed for charging and discharging nickel-cadmium-batteries, nickel-metal-hydrid-batteries, lithium-ionen-batteries, alkali-mangan-batteries, round-cell batteries and plumbbatteries.

Nickel-cadmium-batteriey and nickel-metal-hydrid-battery blocks with 2 to 12 cells can be connected. Lithium-ionen-batteries with 1 - 4 cells. Alkali-mangan-batteries with 2 to 11 cells. Plumbbatteries with 1 to 8 cells.

Technical Data	***curatio* P4**
Main Power Supply	230V 50Hz, 60VA, Option 115V/230V
Battery connection	via 4mm plugs, reverse battery protection
Battery types / No. of cells	Nickel-cadmium-batteries 2 - 12 cells Nickel-metal-hydrid-batteries 2 - 12 cells Lithium-ionen-batteries 1 - 4 cells Round-cell-batteries 2 - 12 cells Plump-batteries 1 - 8 cells Alkali-mangan-batteries 2 - 11 cells
Display / Operation	LCD-Display with 2 x 16 digits, LED signalling "Charged", Operation by four pushbuttons, Menu-guided by display (german / english selectable)
Charge / Discharge current	Max. total current for the four channels 2,2A. Charge and Discharge current selectable from 20mA up to 1,3A in steps of 5mA.
Interface	RS 232, 9600 bps, 9 pol. D-connector
Max. charging Voltage	19,5V
Dimenions	280 mm B x 150 mm T x 95 mm H
Weight	2,5 kg
curatio ®	lateinisch = mantanance, care

For batteries suffering loss of capacity - so called 'memory effect'-, the mode 'conditioning' can be programmed. In this mode the batteries will be charged, discharged and charged again several times. The batteries with 'memory effect' improve their capacity by this process. Upon discharging the measured capacity will be compared with the capacity measured before. The process of discharging and charging will be repeated as long as there is an improvement in capacity.The battery will be charged and discharged during the 'conditioning' at least twice.

curatio P4 automatically detects battery connection. The programmed mode will be performed automatically upon connection.

The standard *curatio* P4 is provided for 230V/50Hz main power connection. Optionally 115V/230V main supply connection are available.

Operating instructions is available in english language. The display language can be switched between ´German´ and ´English´.

Special designs are possible by request.

Updated May 2001, Reserves the right to make changes

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Bauer Daten-Systeme GmbH
Entwicklung und Fertigung elektronischer Systeme
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Battery Tester and Charger *curatio* ®

	curatio ® APL-4	*curatio* ® APL-1	*curatio* ® P4
Overview			
Number of batteries to be checked simultaneously	4	1	4
Maximum Discharging- and Charging Current	8.0A per channel max. 2.0A	2.2A	2.2A per channel max. 1.3A
Minimum Discharging- and Charging Current	10mA	10mA	20mA
Battery Types	NiCd and NiMH 1 – 12 Cells Lithium-Ion-Batteries. + Polymer-Batteries 1 – 5 Cells Plump Batteries 1 – 9 Cells	NiCd and NiMH 1 – 12 Cells Lithium-Ion- Batteries + Polymer-Batteries 1 – 4 Cells Plump Batteries 1 – 8 Cells	NiCd and NiMH 2 – 12 Cells Lithium-Ion- Batteries + Polymer-Batteries 1 – 4 Cells Plump Batteries 1 – 8 Cells
PC – Software	Record and save data of the batteries using the Database Function. Programming of the units through a PC.	Record and save data of the batteries using the Database Function. Programming of the units through a PC.	Record and save data of the batteries.
General	Large illuminated LCD with 16 x 2 characters Robust metal casing Suitable for external program memory	Illuminated LCD with 16 x 2 characters Robust metal casing	Large illuminated LCD with 16 x 2 characters Robust metal casing

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Battery Tester and Charger *curatio* ®

Battery Adapter

Battery Adapter Type 2 with 4 mm safety plugs to connect with the Battery Tester and Charger *curatio* with 4mm plugs.	**Battery Adapter Type 3** with external Program memory to connect to the Tester and Charger *curatio* APL-4. We can deliver battery adapters for all types of batteries such as cell phone batteries, portable lamp batteries, radio batteries, notebook batteries and other batteries.
Typ 2 Motorola GP900 	**Typ 3 Motorola GP900** 
Typ 2 Motorola GP320 	**Typ 3 Custom-designed** Option discharge pulse 10A 

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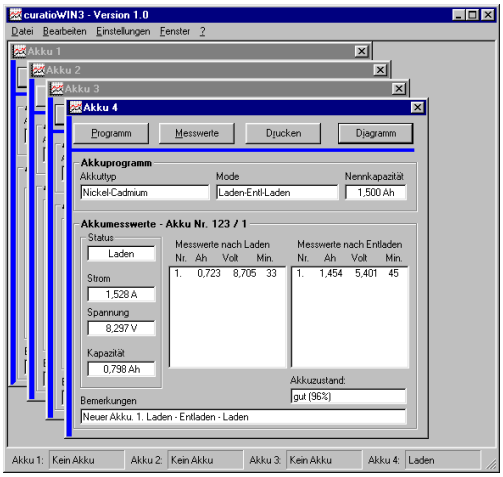
Entwicklung und Fertigung elektronischer Systeme

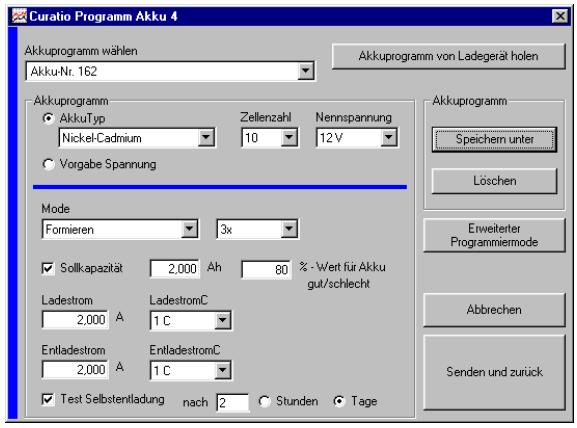
Battery Tester and Charger *curatio* ® APL-1 / 4
PC-Software "*curatio*WIN3"

- Allows computation and management of data and programs of rechargeable batteries in a database.
- Graphic representation of the discharge and charge characteristics or just the acquisition of measured accumulated values, e.g. battery capacity, charging currents, battery voltage, etc.
- Programming and Control of all functions of the Battery Tester and Charger *curatio* APL-1/4 using "*curatio*WIN3".
- Print-outs of the discharge and charge characteristics, the measured accumulated values and the programmed values. Additionally texts can be entered and printed out (For example Customer Information).
- Available for Windows 95 and higher and Windows NT

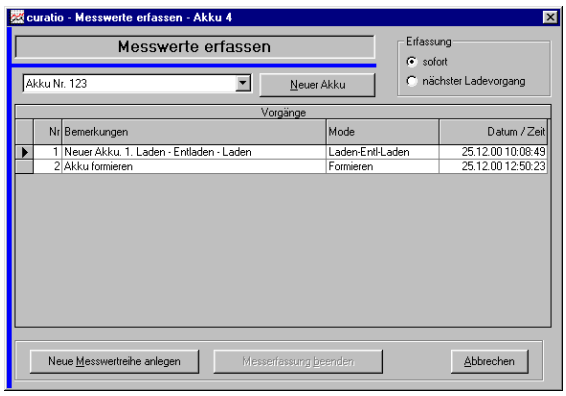
Window „Main Selection“



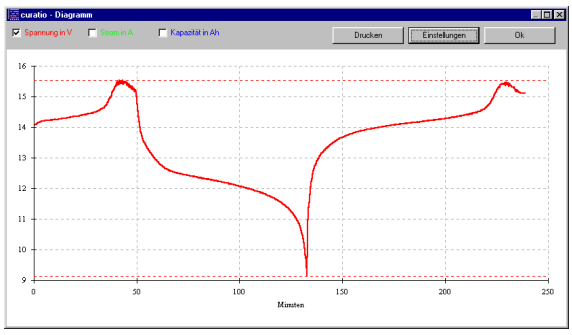
Window „Program“



Window „Acquisition of Measured Values“



Window „ Acquisition of Measured Values“



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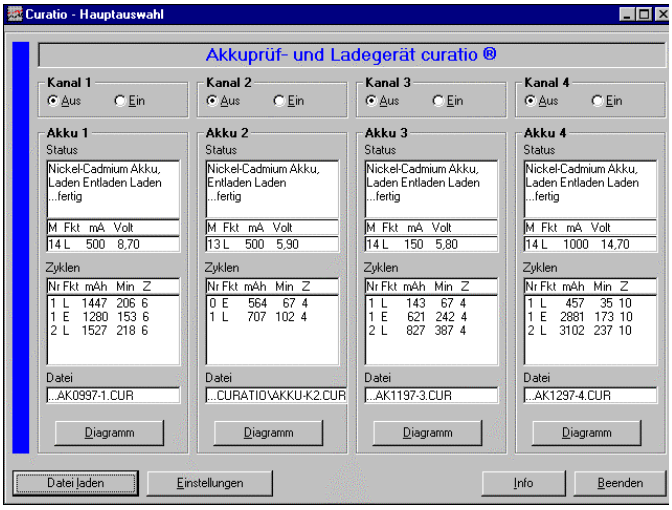
Battery Tester and Charger *curatio* ® P4

PC-Software "*curatio*WIN"

Using the PC-Software *curatio*WIN charge and discharge characteristics of the batteries can be graphically represented, printed out and saved in files. Available for Windows 95 and higher and Windows NT



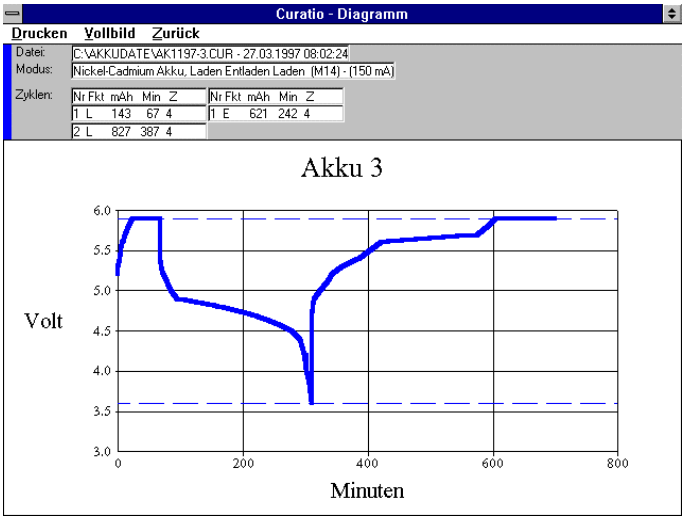
curatio – Main Selection

In this selection the channels 1 through 4 for the recording of data from the Battery Tester and Charger *curatio* can be switched on or off.

Using the "Load File" function, information on batteries which have previously been saved can be loaded.

Current measured values and measured accumulated values, such as capacity etc., are shown.

Files created with the DOS-Version of the PC-Software can also be loaded using *curatio*WIN.



curatio - Diagram

In this selection the voltage curve of a battery during charging and discharging can be graphically represented. In the header the file name, the programmed mode and the measured values for the cycles appear.

Using the “Print“ command the graph can be printed together with the measured values.

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Battery Tester and Charger *curatio* ®

Special Designs of Chargers and charging electronics

	Special design Battery Tester and Charger *curatio* APL-2 based on *curatio* APL-4. Charging / discharging current 2 x 3,0A. Charging voltage up to 46,0V, NiCd / NiMH-batteries 14 – 24 Cells, Plump Batteries 8 – 18 Cells, LiIon- batteries 5 – 10 Cells. Article-No.10094
	Custom-designed. Charger for NiMH-Battery 12 Cells / 9,5Ah. Charging current 4,0A. Power input 24V DC or 100V – 260V AC. 3 for operating state.
Custom-designed charge and discharge electronics for a Nickel-Cadmium-Battery 7.2V 1.5Ah. The power supply is realised through an external power unit. 	Custom-designed charger electronics for two Lithium-Ionen-Batteries 7,2V 2.4Ah. Charging current 2 x 1.2A. Mains power 230V. 

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