

Manual

VAS MPC4 Battery Charger with integrated charging rate check “VAS I-CHECK” (14VDC output voltage for 12VDC lead based batteries)



**Ready to use in
Flash-applications**



Important note:

Only qualified personnel is allowed to use the charger. Do not use the charger in applications for which the device was not originally designed! Read operation instructions carefully! In any case pay attention to the safety instructions and follow the guidelines of the battery manufacturer!

Content

1) General safety instructions.....	2
2) Technical Data	7
3) Connections and Control Elements.....	7
4) Initial Operation / Handling.....	8
5) Operation Mode	10
5. a) SUPPLYMENU – for power supply mode	10
5. b) CHARGEMENU – for battery charge mode	10
5. c) DEVICEMENU – for device specific parameter setting	12
5. d) Charging Rate Check „VAS I-CHECK”	15
6) Operation Mode / Status / Error Messages	22
7) Annex – CELLCHECK / SHORT CELL DETECT	23
8) Annex – Indication / LED and Signal Lamp	24
9) Annex – Characteristic Curves	25
10) Notes	26
11) Annex – Accessories	27
12) Service Center / Repair	27

Features:

- **Secure Flash mode for cars electronic**
 - **All charging parameters configurable**
 - **Comfortable menu guide**
 - **Extensive protection functions and self-protection functions**
 - **Short circuit and reverse polarity protection**
 - **Switchable option to adjustable power supply**
 - **Protection of on board electrical system**
 - **Complete protective functions against defect batteries**
 - **Reliable sparking suppression**
 - **Sealed housing, protected against internal pollution**
- Utilized and approved by well known automotive manufactures**

1) General safety instructions

- The battery charger contains components which are likely to generate electric arcs and sparks, thus the device has to be placed during operation in a special housing or in a room provided for this purpose.
- Warning: When charging batteries explosive gases may occur. As a fact of that avoid fire, open light and spark formation.
- Only charge batteries in well ventilated places.
- The charger is designed for professional applications for motor vehicle manufacturers and garages.
- The charger might only be utilised for the appointed applications.
- Depending on the type of charger it is only allowed to contact lead (Pb) batteries with 12 Volt nominal voltage.
- The battery which has to be charged must have a nominal capacity of 1Ah at minimum.
- It is not possible and not allowed to charge non rechargeable batteries with this device.
- Charging of fresh filled or defective batteries is explicitly forbidden.
- In any case pay attention to the guidelines of the battery manufacturer!
- Mains cables must always be in a proper state, renew defective cables immediately.
- The device mustn't be opened because as well the test certification as the warranty expires.

IMPORTANT SAFETY INSTRUCTIONS and INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ

1. SAVE THESE INSTRUCTIONS

This manual contains important safety and operating instructions.
and

CONSERVER CES INSTRUCTIONS: CE MANUEL CONTIENT DES INSTRUCTIONS
IMPORTANTES CONCERNANT LA SÉCURITÉ ET LE FONCTIONNEMENT.

2. Do not expose charger to rain or snow
3. Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons.
4. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
5. An extension cord should not be used unless absolutely necessary. Use of improper extension cord may result in a risk of fire and electric shock. If extension cord must be used, make sure:
 - a) That pins on plug of extension cord are the same number, size, and shape as those of plug on charger
 - b) That extension cord is properly wired and in good electrical condition; and
 - c) That wire size is large enough for ac ampere rating of charger
6. Do not operate charger with damaged cord or plug – replace the cord or plug immediately.
7. Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman or service center.
8. Do not disassemble charger; take it to a qualified serviceman or service center when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
9. To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or clearing. Turning off controls will not reduce this risk.

10. WARNING – RISK OF EXPLOSIVE GASES

a) WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS:
BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OP
ERATION: FOR THIS REASON; IT IS OF UTMOST IMPORTANCE THAT EACH TIME
BEFORE USING YOUR CHARGER; YOU READ THIS MANUAL AND FOLLOW THE
INSTRUCTIONS EXACTLY

and

IL EST DANGEREUX DE TRAVAILLER A PROXIMITÉ D'UNE BATTERIE AU PLOMB.
LES BATTERIES PRODUISENT DES GAZ EXPLOSIFS EN SERVICE NORMAL. IL
EST AUSSI IMPORTANT DE TOUJOURS RELIRE LES INSTRUCTIONS AVANT
D'UTILISER LE CHARGEUR ET DE LES SUIVRE À LA LETTRE.

b) Reduce risk of battery explosion, follow these instructions and those published by
battery manufacturer and manufacturer of any equipment you intend to use in vicinity of
battery. Review cautionary marking on these products and on engine.

and

POUR RÉDUIRE LE RISQUE D'EXPLOSION, LIRE CES INSTRUCTIONS ET
CELLES QUI FIGURENT SUR LA BATTERIE.

11. PERSONAL PRECAUTIONS

- a) Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
- b) Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- c) Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
- d) If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.
- e) NEVER smoke or allow a spark or flame in vicinity of battery or engine
and
NE JAMAIS FUMER PRÈS DE LA BATTERIE OU DU MOTEUR ET ÉVITER TOUTE ÉTINCELLE OU FLAMME NUE À PROXIMITÉ DE CES DERNIERS.
- f) Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause explosion.
- g) Remove personal metal items such as rings, bracelets, necklaces, and watches when working with lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or similar metal items, causing a severe burn.
- h) Use charger for charging a LEAD ACID battery only. It is not intended to supply power to a low voltage electrical system other than in starter-motor application. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
- i) NEVER charge a frozen battery.

12. PREPARING TO CHARGE

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

13. CHARGER LOCATION

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

14. DC CONNECTION PRECAUTIONS

- a) Connect and disconnect dc output clips only after setting any charger switches to off Position and removing ac cord from electric outlet. Never allow clips to touch each other.
- b) Attach clips to battery and chassis as indicated in 15(e), 15(f), 16(b), and 16(c)

15. FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE. A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION: TO REDUCE RISK OF SPARK NEAR BATTERY:

- a) Position ac and dc cords to reduce risk of damage by hood, door, or moving engine part.
- b) Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
- c) Check polarity of battery posts POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, -) post.
- d) Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to chassis (as in most vehicles), see (e). If positive post is grounded to the chassis, see (f)
- e) For negative-grounded vehicles, connect POSITIVE (RED) clip from battery charger to POSITIVE (POS, P, +) ungrounded post of battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts.
- f) For positive-grounded vehicle, connect NEGATIVE (BLACK) clip from charger to NEGATIVE (NEG, N, -) ungrounded post of battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts.
- g) When disconnecting charger, turn switches to off, disconnect AC cord, and then remove clip from battery terminal.
- h) See operating instructions for length of charge information

16. FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE. A SPARK NEAR THE BATTERY MAY CAUSE BATTERY EXPLOSION: TO REDUCE RISK OF SPARK NEAR BATTERY:

- a) Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.
- b) Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.
- c) Connect NEGATIVE (BLACK) charger clip to free end of cable.
- d) Do not face battery when making final connection.
- e) When disconnecting charger, always do so in reverse sequence of connecting procedure.

GROUNDING AND AC POWER CORD CONNECTION INSTRUCTIONS

Versions having **120-volts** nominal input voltage:

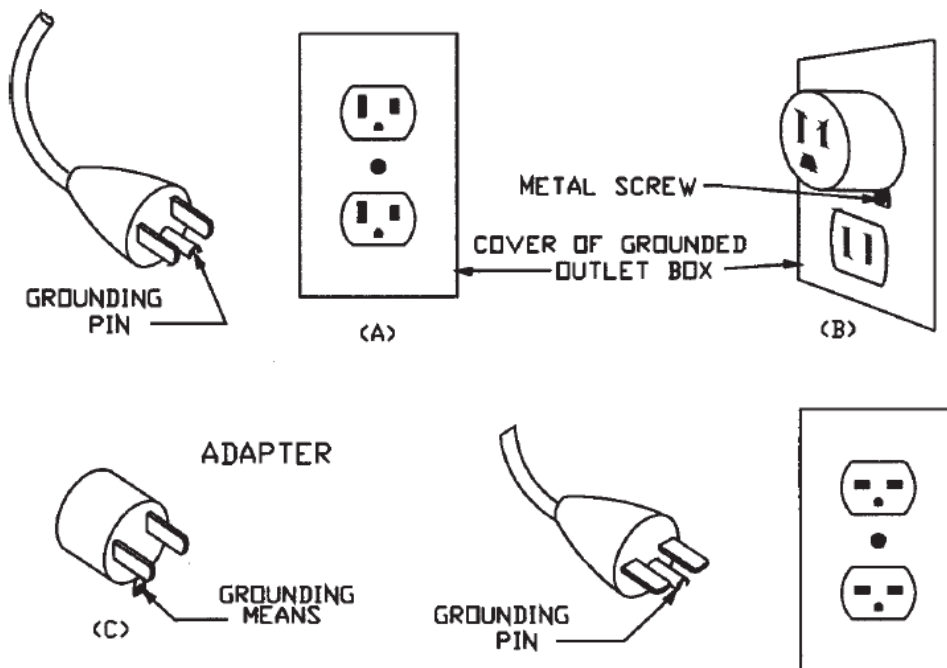
This battery charger is for use on a nominal 120-volt circuit, and has a grounding plug that looks like the plug illustrated in sketch A in Figure 50.1. A temporary adapter, which looks like the adapter illustrated in sketch B and C, may be used to connect this plug to a two-pole receptacle as shown in sketch B if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician.

DANGER – Before using adapter as illustrated, be certain that center screw of outlet plate is grounded. The green-coloured rigid ear or lug extending from adapter must be connected to a properly grounded outlet – make certain it is grounded. If necessary, replace original outlet cover plate screw with a longer screw that will secure adapter ear or lug outlet cover plate and make ground connection to grounded outlet.

Versions having **230-volts** nominal input voltage:

This battery charger is for use on a circuit having a nominal rating more than 120-volts and is factory-equipped with a specific electric cord and plug to permit connection to an acceptable electric circuit. Make sure that the charger is connected to an outlet having the same configuration as the plug. No adapter should be used with this charger.

Figure - Grounding Methods



Source: UL1236 Battery Chargers

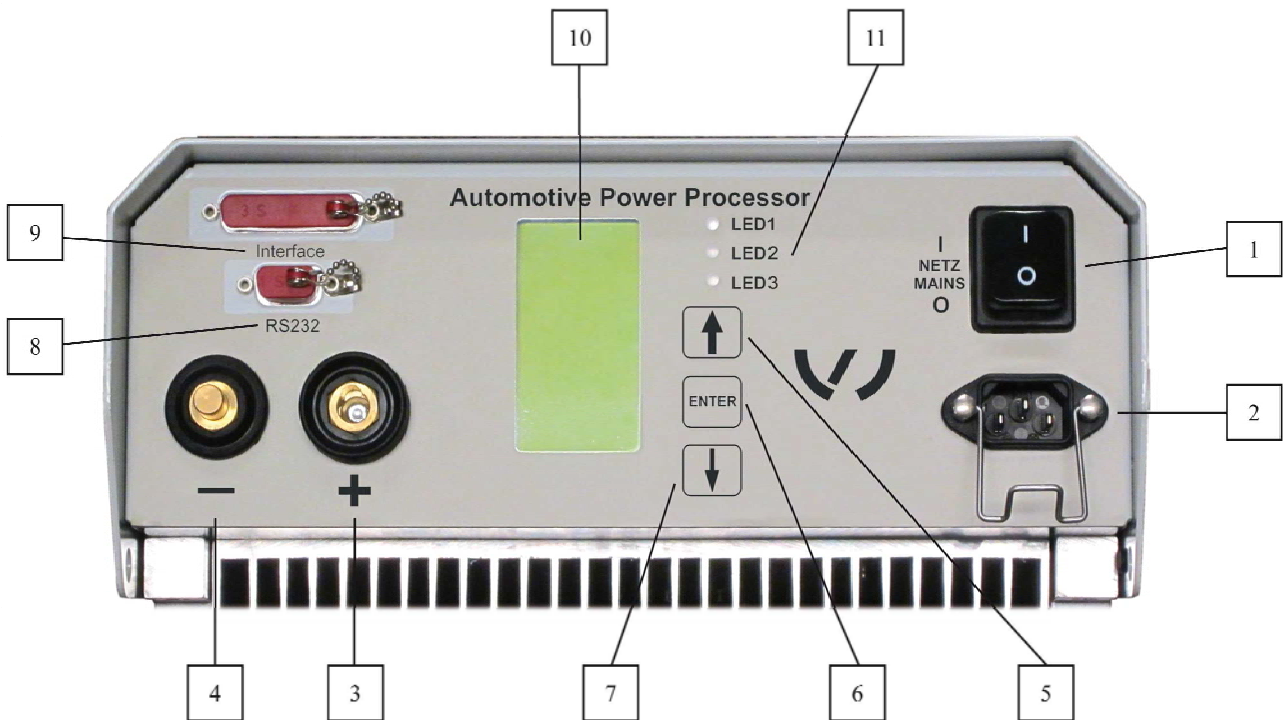
2) Technical Data



For detailed technical data like input voltage, required mains fuse etc. see respective data sheet on our webpage www.deutronic.com or on request direct from Deutronic.

3) Connections and Control Elements

Example: Type "VAS MPC4 Battery Charger" (with MPC4-control board and 1-phase supply):



- | | |
|---|---|
| [1] Power switch ON/OFF | [8] Communication interface (9-pole) |
| [2] Connection for power cord with mains connector (AC IN) | [9] Signal interface (25-pole) |
| [3] "+" Plug for POSITIVE (RED) charger cable (red clamp) | [10] User menu (LC-Display) |
| [4] "-" Plug for NEGATIVE (BLACK) charger cable (black clamp), ground | [11] LED1-3: Signaling operation state, see chapter 8) Annex – Indication / LED and Signal Lamp |
| [5] ↑ UP - Button (select parameter) | |
| [6] ENTER - Button (edit / enter parameter) | |
| [7] ↓ DOWN - Button (select parameter) | |

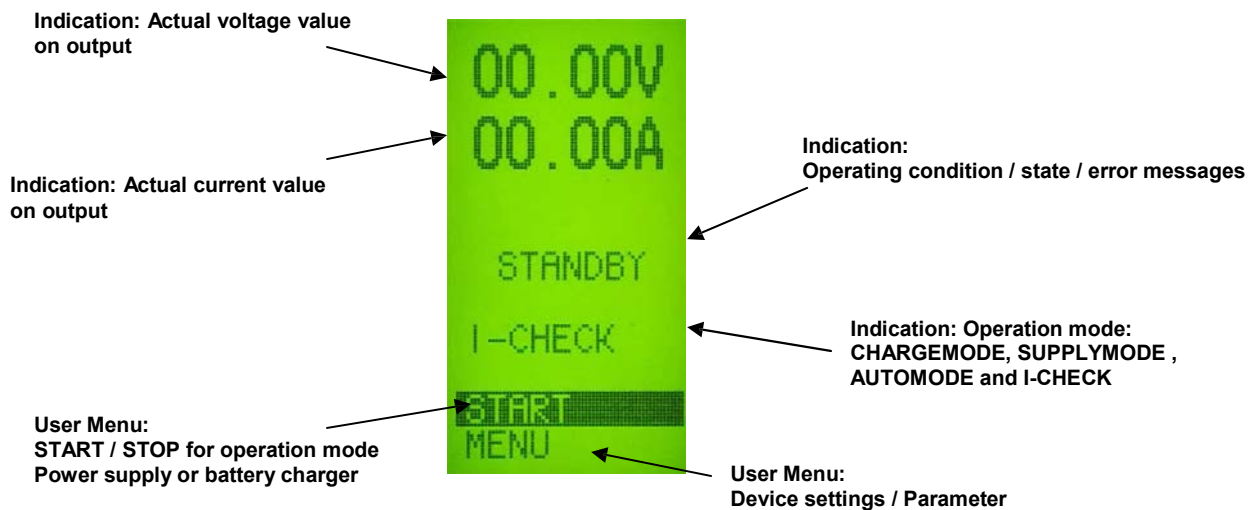
4) Initial Operation / Handling

The battery charger type "VAS MPC4" has two different operation modes – **CHARGEMODE** (battery charging) and **SUPPLYMODE** (normal power supply mode). In addition with operation mode **AUTOMODE** the charger is able to detect the appropriate operation mode via automatic load detection. Furthermore a charging rate check can be done in operation mode **I-CHECK**.

Possible settings and parameters are described in the following point 5) Operation Mode SUPPLYMENU – for power supply mode, CHARGEMENU – for battery charge mode, DEVICEMENU – for device specific parameter setting and Charging Rate Check „VAS I-CHECK”.

User Interface / Display:

In the above part of the start dialog the display shows voltage, current, capacity (Ah), previous charging time, operation mode / state / error messages:



Important note for operation:

Should a parameter be changed by the user, it can be selected with the UP / DOWN buttons at the device and activated for editing by means of the ENTER key. When a parameter value blinks, it is able to be edited with the UP / DOWN buttons. When pressing the ENTER key the new adjusted value is accepted.

User menu:

- Display 'START/STOP' changes due to operating mode
- Display '**START**': The VAS MPC4 battery charger is on stand by and can be start in supply mode or charging mode by selecting START (and pressing the ENTER button)
- Display '**STOP**': Device is in supply or charge mode. When pressing the ENTER button the supply/charge mode stops

Note:

Some parameters can only be configured when the VAS MPC4 charger is not in supply or charge mode (e.g. changing the operation mode like AUTO-/SUPPLY-/CHARGE-MODE etc.), that means before the operation mode can be changed, the device must be set to STOP.

- **MENU**: Device configuration (as the case may be it is protected with a key lock)
 - Selection of operation mode (SUPPLYMODE / CHARGEMODE / AUTOMODE / I-CHECK)
 - Configuration menu (SUPPLYMENU, CHARGEMENU, DEVICE MENU)
 - Selection of language (German, English)

Device configuration:

The configuration of the battery charger can be accomplished within the topic 'MENU' (selection is done with the UP/DOWN button and confirmation with the ENTER-button).



Active Key lock:

If the key lock is activated on the battery charger – the display shows the following.

Deactivate the key lock:

Activate the input field with the ENTER-button, change the code number with the UP/DOWN buttons and confirm the code with the ENTER-button (the user is able to set and activate the code for the key lock in the device menu).

Indication if the key lock is deactivated, or if the entered code is okay:



Selection: AUTOMODE / CHARGEMODE / SUPPLYMODE / I-CHECK:

Shows the active mode on the display – if the operation mode should be changed just activate with the ENTER-button the item and edit it with the UP/DOWN button.

Device configuration: SUPPLYMENU / CHARGEMENU / DEVICEMENU:

Parameterization of the single operation modes on the battery charger can be done in the respective submenu.

Language selection German, English:

Shows the active language on the display - if the operation mode should be changed just activate the item with the ENTER-button and edit it with the UP/DOWN button.

Initial Operation:

Operation mode AUTOMODE – automatic detection of batteries and ohm resistive loads:

- Switch-on the power switch
- Set the battery charger to the operation mode AUTOMODE
- Connect load / battery with right polarity (red [+] / black [-])
- **Start supply:** Select in the main menu the START item and start the power output by pressing the ENTER button
- **End supply:** Choose the STOP item of the main menu and press the ENTER button



Note:

- With activated **AUTOMODE** the battery charger is able to detect via the integrated load detection whether a battery or an ohm resistive load is connected.
- A present battery is detected via its counter voltage.
- An ohm resistive load is detected by means of a small test current.
- With operation mode **SUPPLYMODE** only an ohm resistive load is allowed to be supplied (e.g. automobile without a connected battery).
- In **CHARGEMODE** only a connected battery can be supplied.
- In operation mode **I-CHECK** the charging rate check can only be done with a connected battery.

5) Operation Mode

5. a) SUPPLYMENU – for power supply mode


Parameter	Nominal value	Value / Setting range / Information
Output voltage	U	2 to 15,5 V [*] Note: The limiting value for max. voltage 15,5V is a SAFETY LIMITATION and can be adjusted due to long load cables. See 5. c)DEVICEMENU – for device specific parameter setting
Current limiting output current	I _{max}	I_{max} [*] depends on charger version (for details see data sheet) Note: I _{max} is depending on the preset voltage and limited via a dynamic temperature control

[*] **Note:** Should the preset power of the battery charger be higher than the nominal power of the device, the charger adjusts automatically the limiting values, if needed.

Example: If the voltage is in the threshold and the output voltage U is heightened further, so automatically the max. current I_{max} is reduced and vice versa.



5. b) CHARGEMENU – for battery charge mode

Parameter	Value	Setting range / Information
Charging voltage	U	U_{tri} to U_{max} (U = typ. 14,2 .. 14,8 V) Note: In chapter 5. c) DEVICEMENU the max. charging voltage U _{max} is fixed (standard value is 15,5V)
Trickle voltage	U _{tri}	U_{min} to U (U_{tri} = typ. 13,2 V) Note: Limiting values for the trickle charge voltage are starting voltage and adjusted charging voltage.
Starting voltage	U _{min}	5V to U_{tri} (U_{min} = typ. 5 .. 11,5 V) Minimum voltage of the battery - this defines the voltage limit which must be exceeded by the battery before starting to charge.  Note: The starting voltage is a SAFETY FUNCTION which ensures that for charging really an acceptable battery is connected. Due to safety reasons in operation mode AUTOMODE no batteries are accepted which have a lower voltage level than 11,0VDC. However should a deep discharged car battery be charged, the operation mode has to be set from AUTOMODE to CHARGEMODE.
Current limit	I _{max}	I_{max} depends on charger version (for details see data sheet) Under Limit of I _{max} is dynamic and is the sum of the values I _{tri} and I _{re} .
FC current	I _{tri}	1 to 20 Ampere (I_{tri} = typ. 2,5 .. 10 A) Current limit, below this value the battery charger switches to trickle charge mode
Recharge current	I _{re}	0,5 to 30 Ampere (I_{re} = typ. 1,0.. 2,5 A) Threshold above I _{tri} (offset), from which on the battery charger switches back to charge mode.

Parameter	Value	Setting range / Information
Max. battery charge capacity (in Ampere hours)	Q_{max}	1 to 6000 Ah ($Q_{max} = \text{typ. 250 Ah}$) SAFETY FUNCTION - stops charging! Hint for a full charge of the battery: Adjust the limit for battery charging capacity in the setup more then about 20% higher as the nominal value given by the battery manufacturer
Min. charging time	T_{min}	0 to 240 Minutes ($T_{min} = \text{typ. 15 min}$) Time interval after which the charger is allowed to switch back to trickle charge
Max. charging time	T_{max}	0,1 to 99 Hours ($T_{max} = \text{typ. 24 hours}$) SAFETY FUNCTION - stops charging!


```

CHARGEMENU
U : 14.4V
Utri: 13.2V
Umin: 5.0V
Imax: 45.0A
Itri: 2.5A
Ire : 2.5A
Qmax: 250Ah
Tmin: 15m
Tmax: 24.0h
FEATURES
BACK

```

Parameter	Value	Setting range / Information
FEATURES:	BFL: ON / OFF	BFL-Signal 'battery full' activated / deactivated
	I_{bfl}	Current limit, at which the signal 'battery full' is indicated via LED or via a connected external signal lamp ($I_{bfl} = \text{typ. 12,0 A}$) Note: Signalization of 'battery full' state is independent from any trickle current limit
	BFL-LOCK ON / OFF	Delay time T_{bfl} for BFL-Signal After current is below I_{bfl} and the timer T_{bfl} has expired, then the BFL status signal is permanent on (until battery is disconnected). Note: The parameter BFL-LOCK is only active if in addition the parameter BFL-Signal ('battery full') is activated.
	T_{bfl}	1 to 60 Seconds ($T_{bfl} = \text{typ. 10 seconds}$) (see note concerning parameter BFL-LOCK)
	SHORTCELL: DETECT ON / OFF	Definition / explanation – see 7) Annex – CELLCHECK / SHORT CELL DETECT

5. c) DEVICEMENU – for device specific parameter setting

Parameter	Value	Setting range / Information
STORAGE	OFF	OFF No temporary saving of the charging process state.
	CYCLIC	CYCLIC Approximately every 5 minutes the device conditions are saved: Device mode, counter, timer, temporary parameters etc. <i>Note: If during a charge process the voltage supply of the charger is interrupted, then the battery charging is continued automatically at setting CYCLIC as soon as the mains supply is back again (all meter readings, e.g. previous load time, are further updated)</i>
PARAMETER	DEFAULT	Factory-made standard settings for the chargers parameters is the parameter DEFAULT
	USER	If one of the predefined standard settings is edited, so in the DEVICEMENU appears operation mode USER
	MAN.START	The user starts the device manually.
	AUTOSTART	As soon as mains is connected the charger starts automatically in SUPPLY-/CHARGEMODE.
	MAN.STOP	The user has to stop the operation manually. IMPORTANT NOTE: The safety shutdown (Ah limit, max. charge time) is deactivated by MAN.STOP!!!
	AUTOSTOP	When reaching the Ah limit or the maximum charge time the device switches to standby mode automatically (reset can be achieved by opening the current clamps). 

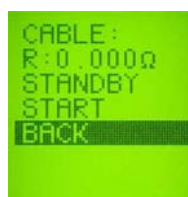


Parameter	Value	Setting range / Information
SAFETY:		
Max. voltage	U_{max}	Standard value: 15,5V <i>Note: The limiting value for max. voltage 15,5V is a SAFETY LIMITATION and can be adjusted e.g. because of voltage decreasing due to long cables. The safety limitation can be changed between values of 17,0V...20.0V depending on charger type.</i>
Short circuit nom. voltage	U_{srt}	Standard value: 2,0V If the voltage on the output drops below the preset value, so a short circuit is recognized and the current is limited to 0,5A.

Parameter	Value	Setting range / Information
Short circuit current limit	<p>LIMITING</p> <p>PULSING</p>	<p>If an overload or a short circuit is detected (U_{out} drops below the voltage limit U_{srt}) then the current is limited by the battery charger:</p> <p>If the voltage on the output drops below U_{srt} then the current is limited to 0,5A.</p> <p>If the voltage on the output drops below U_{srt} then the current is limited to a fixed value of 0,5A for about 60 seconds. After this time interval the current limit rises in order to test if the overload / short circuit is present longer.</p> <p>Altogether three pulses are given out from the battery charger– should the overload / short circuit be present any longer then no more trials are taken and current is limited to max. 0,5A until a reset of the device.</p>
Switch on delay time	T_{del}	<p>1 to 60 Seconds ($T_{del} = \text{typ. 1 second}$)</p> <p>Note: Switch on delay is working for both - normal start-up and 'Remote-ON/OFF'</p>



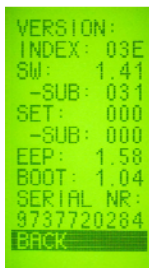
Parameter	Value	Setting range / Information
CABLE:		<p>Carry out the cable compensation:</p> <p>In order to start the measurement of the cables resistance the cables attached to the battery charger during supply/charging process have to be short-circuited on the free end without any load.</p> <p>Choose the menu item START and confirm by pressing the ENTER-key.</p> <p>If the cable compensation has been carried out successful then the measured resistance value is shown in the display (e.g. R: 0,029 &)</p>
Cable resistance	R: 0.000 Ω	Shows the measured / preset cable resistance value. If the resistance value is selected directly in the menu, then the user is able to chose between the value determined at the cable compensation and $R = 0.000\Omega$ (no cable compensation.)
Status	<p>STANDBY</p> <p>NO CABLE</p> <p>MEASURING</p>	<p>Ready to start measurement</p> <p>No cable connected or no cable short circuit</p> <p>Measurement of cable resistance is running</p>
Cable compensation	START / STOP	Start cable compensation or abort a running measurement



Parameter	Value	Setting range / Information
DISPLAY:		
SLEEPMODE	ON / OFF	Activate / deactivate display sleep mode. After about 1 min of no user action on the battery charger the display goes into sleep mode (see picture below). Note: Useful if operation state should only be signaled by the signal LEDs or an external control unit / signal lamp.
SIGNAL	0 ... 5	Preset individual signalization modes for LEDs 1-3 and external signal lamp - see also 8) Annex – Indication / LED and Signal Lamp
KEY LOCK	ON / OFF	Activate / deactivate PIN code to limit access to the user menu
CODE	0000 .. 9999	Preset PIN code (e.g. 0005), user selectable



Parameter	Value	Setting range / Information
VERSION:		Displays version information and charger SERIAL NR.



5. d) Charging Rate Check „VAS I-CHECK”

Selection, configuration and error messages at start of test:

Like every other operation mode the charging rate check “VAS I-CHECK” needs to be selected first, i.e. a possibly, already running supply mode needs to be stopped by pressing the “STOP” button and then switching into “Standby-Mode”.



Fig. shows battery charger in „standby mode“

The charging rate check “VAS I-CHECK” is activated by the following procedure:

Select the menu line where the current operation mode is displayed (in the example above “AUTO-MODE”) via the UP / DOWN buttons and press the <ENTER> button. The line selection starts to flash.

By now the individual operation modes can be flicked through by the UP / DOWN buttons. Press the <ENTER> button when “I-CHECK” is displayed. Thereupon operation mode “I-CHECK” is activated and you are getting relocated to the configuration window.

If operation mode “I-CHECK” was already selected before, the charging rate check can be activated via the menu item “START”.

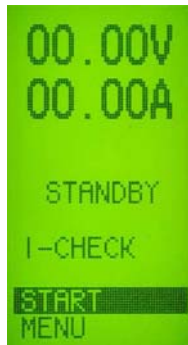


Fig. shows a battery charger in operation mode „I-CHECK“

The configuration window displays the deposited "Default-Parameter" of the charging rate check:



The entry of the battery capacity "Qbat" is necessary for the charging rate procedure. Therefore the "Qbat" menu line is automatically selected when opening the configuration window. By pressing the <ENTER> button the line selection starts to flash so that the capacity of the connected motor vehicle battery can be adjusted with the UP / DOWN buttons from the battery chargers controller board (the displayed capacity value is increased with the "∇" arrow key and decreased with the "⊙" arrow key). By pressing the <ENTER> button again the value is selected.

When the accurate battery capacity (for the charging rate check) is adjusted the check can be started by selecting the menu line "TEST START". If you don't want to start the check you can leave the "I-CHECK" configuration window by selecting "BACK".

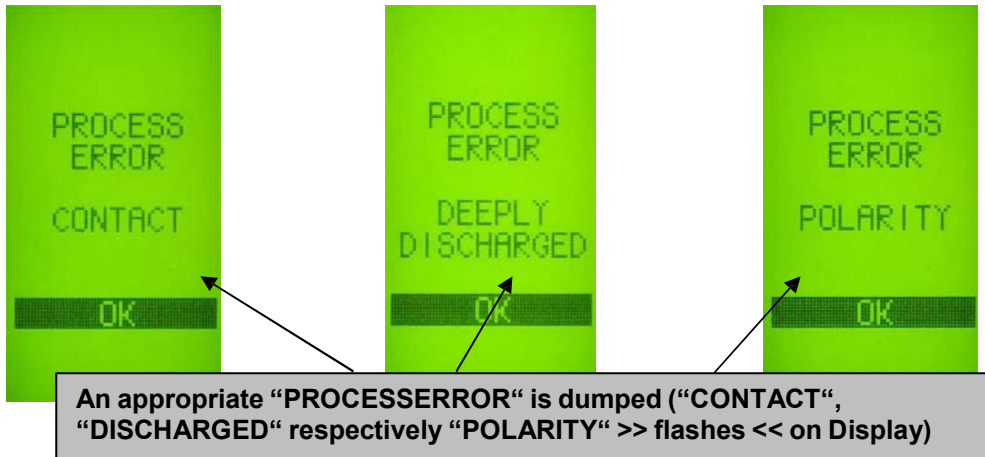
Important information:

It is assumed that the charging rate check ("VAS I-CHECK") is only performed "stand alone", otherwise the measurements from the charging rate check values are distorted by parallel electrical consumers ("stand alone" means the battery is tested alone and without parallel load, the battery is so disconnected from the vehicle on-board electronics or all the electrical consumers in the vehicle are disabled).

If an error occurs at the beginning of the test an appropriate "PROCESS ERROR" is printed at the battery chargers display and the charging rate check is stopped.

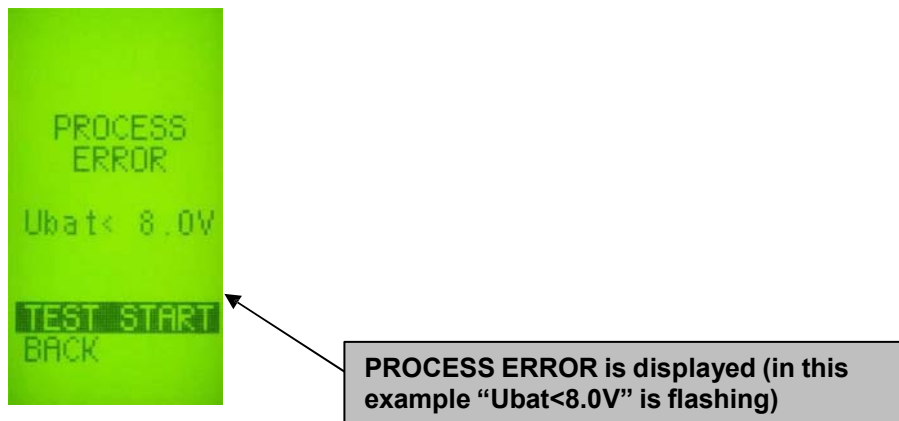
Examples:

- * Message **CONTACT:** No battery detected or rather connected
- * Message **POLARITY:** Battery is connected with reverse polarity
- * Message **DEEPLY DISCHARGED:** Battery is detected, but its voltage level is beneath the defined switch on voltage limit Umin of the charging menu (therefore a switch-in of the supply may not occur)



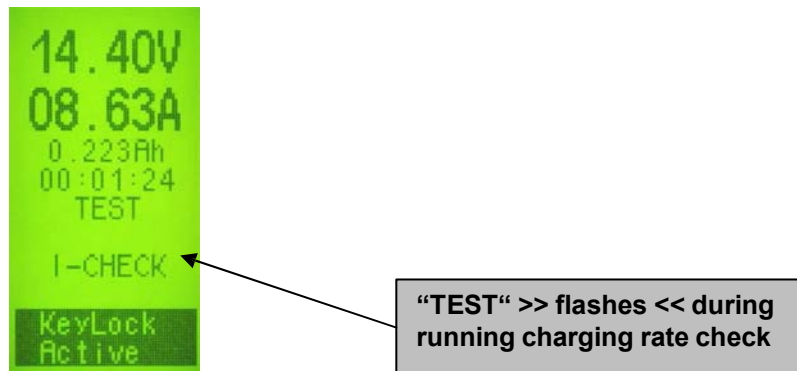
- * Message **Ubat<Umin:** Battery is detected, its voltage level is below the defined switch on voltage Umin (but Ubat voltage is higher then the VAS I-CHECK deep-discharge threshold of 1V)

The following example shows the display for Umin = 8.0 V and Ubat = [1,0 .. 8.0]V. With selecting the menu item "TEST START" the charging rate check is started. With selecting the menu option "BACK" it is canceled.



Running VAS I-CHECK:

If the "charging rate check" has been successfully started, "TEST" flashes in the display while the check is performed - also key lock is activated and this is shown via display printout "KeyLock Active").

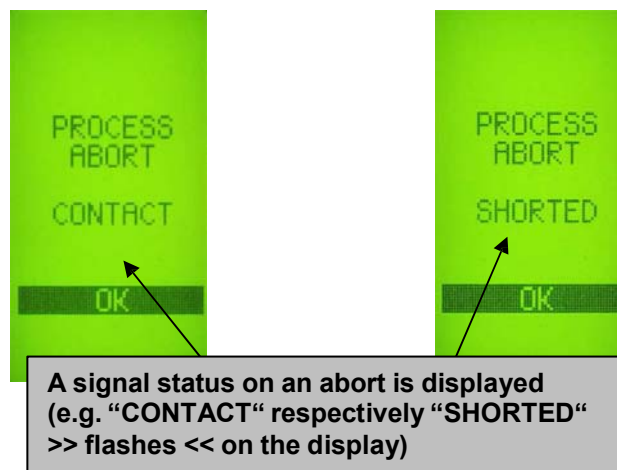


An interrupt of a running "I-CHECK" charging rate check is only possible by disconnecting the cable clamps from the battery, because of the activated "KeyLock".

If an error is registered during running test, the charger will display an appropriate "PROCESS ABORT" message and stop the test procedure.

Examples:

- * Message: **CONTACT:** Battery got disconnected
- * Message: **SHORTED:** Short circuit was recorded at the output



By reconnecting the battery either "I-CHECK" needs to be restarted or - according to the chosen operation mode - a normal supply procedure is performed.

End of the test, display test results and charge of insufficiently charged batteries:

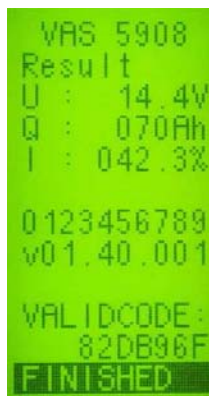
After the I-CHECK test is finished the following result appears on the device display, depending on the determined:

1) Charging rate I <100%

If the charging rate of the battery is at the end of the test below 100%, then the supply of the battery is stopped and the following message is displayed until the menu item "OK" ist selected - afterwards program switches to the results window:



According to specifications the values contained in the results window can be transferred into the battery inspection sheet. The results window is displayed as long as the user doesn't quit it by selecting "FINISHED".

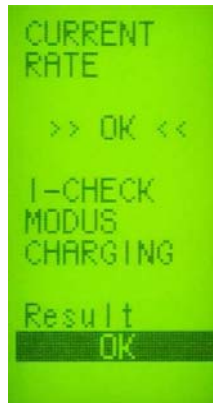


By selecting "FINISHED" the charger redirects into "standby mode". There the charging rate check can be restarted or another operation mode can be chosen.

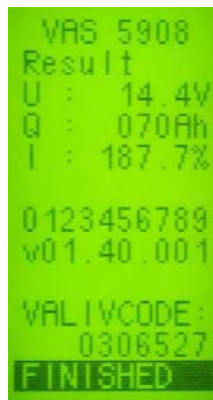


2) Charging rate I >100%

If the charging rate of the battery is at the end of the VAS I-CHECK more than 100%, then the supply of the battery continues in the background and display shows the following selection window:



By choosing item "Result" the display shows the results window as long as the user doesn't quit it by selecting "FINISHED" (because the battery is only insufficient charged there is no need to filled out a warranty claim sheet)



After selecting "FINISHED" at the results window (or after selecting "OK" at the previous shown selection window) the device switches to the "I-CHECK CHARGEMODE".

The pictures below show how a running charging procedure in "I-CHECK charging mode" is signaled to the user on the device screen (the previous activated key lock is canceled during "I-CHECK charging mode"):



“CHARGE“ >>flashes<< if it switches into the “I-CHECK CHARGEMODE” because of insufficient load



“TRICKLE“ >> flashes << if it switches into trickle charging at the end of the “I-CHECK CHARGEMODE”

Important note – short cell check is activated automatically during “I-CHECK charge mode”:

Under the assumption that the "VAS I-CHECK" test is performed under "stand-alone" conditions (i.e. without parallel electric consumers), as explained previous, “CELLCHECK / SHORT CELL DETECT” is activated for the following "I-CHECK charge mode". The activation is done automatically and independent from the configuration of a normal charging process. At the end of the "I-CHECK charging mode" the “CELLCHECK” is reset to the default device settings.

Note:

If in addition to the battery also parallel electrical consumers are active while CELLCHECK test is performed, it may lead to a corrupted result and so possibly to unfounded "SHORT CELL" error messages.

6) Operation Mode / Status / Error Messages

Display	Meaning / Reasons	Information / Trouble shooting
Ah-LIMIT	Charging process was stopped after the predefined limiting value for the battery capacity (Ah) has been exceeded	<ul style="list-style-type: none"> In the setup menu a value has been adjusted too low for the battery capacity Battery defective <p>Note for a complete charging of the battery: Switch the limiting value (Ah) given in the setup for the charging process approximately 20% higher than the manufacturer is declaring for the battery capacity</p>
CABLE COMP	Cable compensation of the battery charger is active	<ul style="list-style-type: none"> Accomplish cable compensation – see also capture 5. c) DEVICEMENU – for device specific parameter setting
CELLCHECK	Cell check is performed (only charge mode)	<ul style="list-style-type: none"> Definition / explanation – see 7) Annex – CELLCHECK / SHORT CELL DETECT
CHARGE	The battery charger is in operation mode battery charge	
CONTACT (blinking)	Device started and automatic load detection active – battery charger waits for the connection of a battery or load	<ul style="list-style-type: none"> Connect battery or load As the case may be there is a defective cable (check connection to the load or battery) Check Starting voltage U_{min}
DISCHARGED	Battery is detected, but its voltage level is beneath the defined switch on voltage limit U_{esp} of the charging menu	<ul style="list-style-type: none"> Is voltage limit U_{esp} configured right? Battery defective
EXT. STOP	Operation is interrupted via the Remote-OFF signal line	<ul style="list-style-type: none"> Detach GND connection at PIN 25 (Remote-ON/OFF)
EXT.VOLT	Over voltage at the output - a voltage which is at least 1 Volt higher than the predefined charging voltage U_{out} is measured from the battery charger on the output	<ol style="list-style-type: none"> Check connected load for any error (as the case may be a wrong battery ?) Main switch off / waiting until display goes off Switch-on battery charger In operation mode STANDBY the battery charger displays external voltages
FAN	Fan defective (device works with reduced output power)	<ul style="list-style-type: none"> Contact service station
HIGH TEMP.	Temperature too high - device is not working within the specified temperature range (charger works with reduced output power)	<ul style="list-style-type: none"> On high temperature the charger reduces the output current and displays the message " HIGH TEMP." (operation is going on with reduced output power) Pause operation or improve cooling of the device
LOW BAT.	Deep discharged battery: Battery voltage is less than the predefined Starting voltage U_{min}	
MAINS HIGH	Main voltage is too high – attention, the device is damaged by an input voltage higher than the specified tolerance range	<ul style="list-style-type: none"> Detach mains cable and check installation
MAINS LOW	Main voltage is too low – supply is insufficient (device works with reduced output power)	<ul style="list-style-type: none"> Check mains supply
MAX.TIME	Abort because maximum charging time limit is exceeded	<ul style="list-style-type: none"> Check battery – as the case may be the battery is defective (reason for exceeding limit MAX.TIME might be an additional load – e.g. light etc.)

NTC ERROR	Temperature sensor defective (device works with reduced output power)	<ul style="list-style-type: none"> Contact service station
------------------	---	---

Display	Meaning / Reasons	Information / Trouble shooting
POLARITY	Battery is connected with wrong polarity to the charger	<ul style="list-style-type: none"> Connect black clamp to (-) pole Red clamp is connected to (+) pole
RECHARGE	If in operation mode trickle charge the load draws a current higher than the recharge threshold ($I_{tri}+I_{re}$), then the charger is reset into charge mode.	<ul style="list-style-type: none"> Switch off any additional load (e.g. light, ignition etc.)
RELAY VOLT	Voltage adjustment internal /external aborted	<ul style="list-style-type: none"> Contact service station
SHORT CELL	Shorted cell has been detected at the connected battery - progress aborted	Note: In the case of a definitely good battery a faulty report can be caused by a load which is switched in parallel to the battery Remedy: Turn off 'SHORTCELL DETECT' or remove load which is switched in parallel
SHORTED	Short circuit (!) detected at the output	<ul style="list-style-type: none"> Check load and cables for any damages To continue operation after error is removed, release clamps and connect the load again
STANDBY	Idle state (standby), the device is ready for operation	<ul style="list-style-type: none"> Begin charging / supply mode by selecting menu item START Start configuration via item MENU
STARTUP	'Switch on delay time' is active, the supply starts after the predefined idle time	<ul style="list-style-type: none"> Parameterisation - see 5. c) DEVICEMENU – for device specific parameter setting
SUPPLY	Operation 'Supply mode' is active	
TRICKLE	Charge mode is finished, the charger operates in trickle mode	

7) Annex – CELLCHECK / SHORT CELL DETECT

To run this feature correctly, no load impedance may be connected in parallel to the charged battery.

Disconnect the battery from the vehicle before starting the cellcheck!

To detect defect batteries it is necessary to adjust the maximum amp-hour for the battery before the charge operation starts. The adjusted ampere hours should not be less than the written ampere hours on the battery because the unit stops charging before the battery is charged high enough. The best way to detect defect batteries is to adjust the ampere hours 10 to 20% higher than the written ampere hours on the battery. For example a battery with 50 ampere hours should be adjusted in the charger unit with 60 ampere hours. In any case should the ampere hours in the charger unit be adjusted even when the "CELLCHECK" is "OFF", because the ampere hours menu limits the charge process and avoids extreme over-charging. If the "CELLCHECK" is active, the charge process stops twice for 30 seconds automatically. During that stop the charger measures the battery voltage and the internal algorithm separates good and bad batteries. In case of defect batteries stops the charging process and in the display appears "SHORT CELL DETECT".

8) Annex – Indication / LED and Signal Lamp

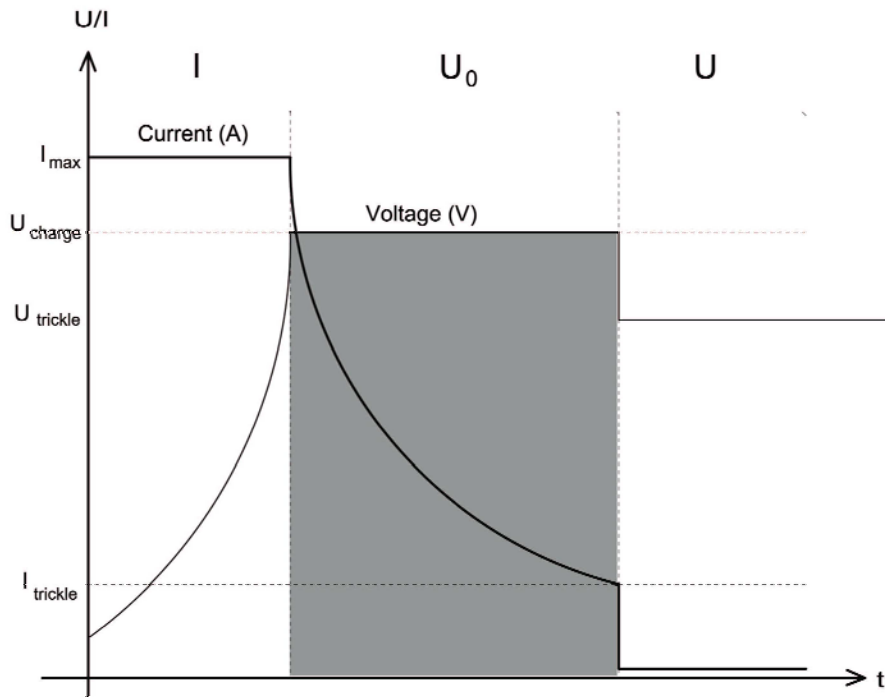
Indication	SIGNAL '0'		SIGNAL '1'		SIGNAL '2'	
	CHARGEMODE	SUPPLYMODE	CHARGEMODE	SUPPLYMODE	CHARGEMODE	SUPPLYMODE
Green (permanently on)	TRICKLE / BFL	Supply	TRICKLE / BFL	---	TRICKLE / BFL	Supply
Green (blink)	---	---	---	---	---	---
Yellow (permanently on)	Charge / Recharge	---	Charge / Recharge	Supply	Charge / Recharge	---
Yellow (blink)	Contact (blink) / Application Error		Contact (blink)		Contact (blink)	
Red (permanently on)	Device Error (Fan, NTC etc.)		Application Error	---	Application Error	---
Red (blink)	---	---	Device Error (Fan, NTC etc.)		Device Error (Fan, NTC etc.)	
Off	Ext. OFF / Standby		Ext. OFF / Standby		Ext. OFF / Standby	

Indication	SIGNAL '3' (V1.28 and later)		SIGNAL '4' (V1.30 and later)		SIGNAL '5' (V1.30 and later)	
	CHARGEMODE	SUPPLYMODE	CHARGEMODE	SUPPLYMODE	CHARGEMODE	SUPPLYMODE
Green (permanently on)	TRICKLE / BFL	Supply	TRICKLE / BFL	Supply	TRICKLE / BFL	Supply
Green (blink)	---	---	---	---	---	---
Yellow (permanently on)	Charge / Recharge	---	Charge / Recharge	---	Charge / Recharge	---
Yellow (blink)	Contact (blink)		---	---	---	---
Red (permanently on)	(*) Application Error	---	Device Error (Fan, NTC etc.) / Application Error		Application Error	---
Red (blink)	Device Error (Fan, NTC etc.) / (*) BAT deep discharged		---	---	Device Error (Fan, NTC etc.)	
Off	Ext. OFF / Standby		Ext. OFF / Standby / Contact (No Load)		Ext. OFF / Standby / Contact (No Load)	

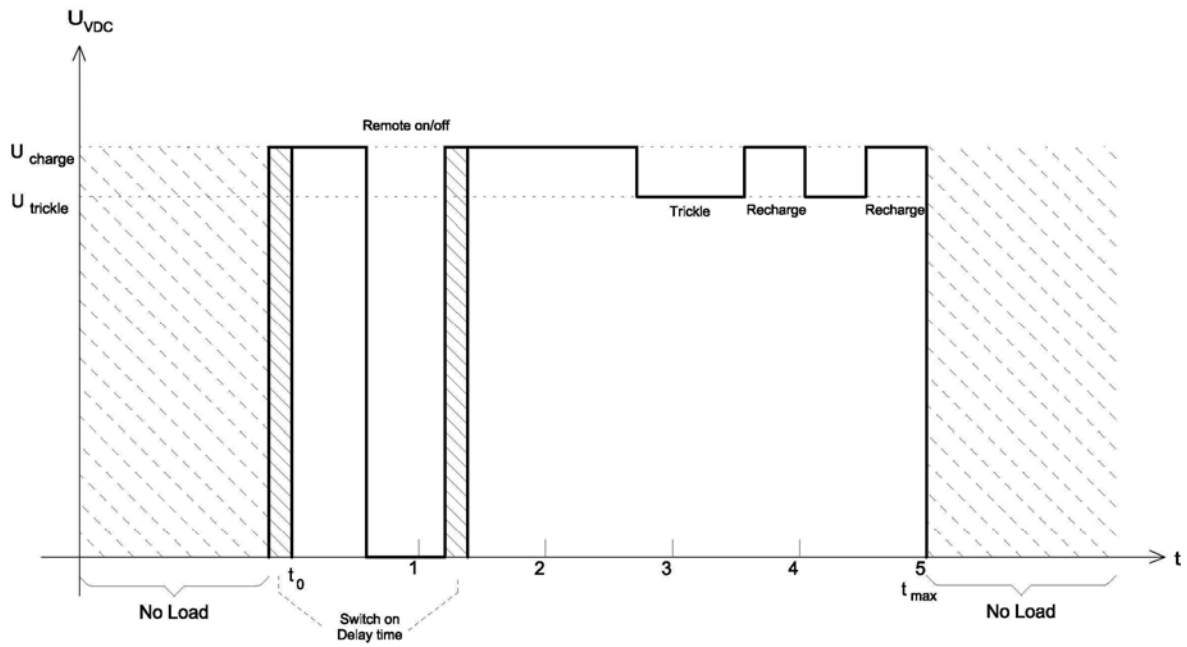
Indication	SIGNAL '6' (V1.35 and later) (Command Mode)		SIGNAL '7' (V1.37 and later)		SIGNAL '8' (V1.37 and later)	
	CHARGEMODE	SUPPLYMODE	CHARGEMODE	SUPPLYMODE	CHARGEMODE	SUPPLYMODE
Green (permanently on)	User defined (via Command)		TRICKLE / BFL	Supply	TRICKLE / BFL; (*) Q-T-max State = 2 or 4 [Uout=Tri]	Supply
Green (blink)	---	---	---	---	---	---
Yellow (permanently on)	User defined (via Command)		Charge / Recharge	---	Charge / Recharge	---
Yellow (blink)	---	---	---	---	Contact (blink)	
Red (permanently on)	User defined (via Command)		Ext. OFF / Standby / Contact 'blink' (No Load)		(*) Application Error	---
Red (blink)	---	---	Device (Fan, NTC etc.) / Application Error (e.g. Battery)		Device Error (Fan, NTC etc.)	
Off	Standard / User defined (via Command)		Device OFF (Mains Supply OFF)		Ext. OFF / Standby	

9) Annex – Characteristic Curves

Charging characteristic I-Uo-U:



Charging characteristic - Remote-ON/OFF, trickle and recharge:



10) Notes

11) Annex – Accessories

Wall mount, base rack, transport cart, charging cables (3 and 5 meters), mains cable (3 and 5 meters), remote cable, programming unit, external high visibility, signal lamp and more on our webpage www.deutronic.com

12) Service Center / Repair

Instructions:

To ensure a fast and smooth processing it is absolutely important that every device sent to Deutronic for repair has a fully filled out return service scripture in which for every device all relevant data (e.g. address, name contact person, phone number etc.) as well as a detailed fault description is included.

The needed return service scripture as well as the world wide service partner addresses you will find on our web page www.deutronic.com in the menu item 'service worldwide'.

No liability:

The customer is responsible for the use of the device according to the specifications. Regardless of the type, Deutronic is not liable for damage incurred through the use of the device.

Contact:

Deutronic Elektronik GmbH
Deutronicstraße 5
D-84166 Adlkofen / Germany

Tel.: +49 (0)8707 / 920-0
Fax: +49 (0)8707 / 1004
E-Mail: sales@deutronic.com
<http://www.deutronic.com>

All data at nominal input, full load and 25 °C ambient temperature, if not marked otherwise.

Technical modifications and mistakes reserved.

Products are described by information contained in catalogs and data-sheets. It is not be considered as assured qualities. Stresses listed under „Maximum Rating“ (one at a time) may be applied to devices without resulting in permanent damage. The operation of the equipment for extended periods may affect device reliability.

Limiting value tolerance are subject to usual fluctuation.