digital controlled devices

dicodes

2395 / 2395T



manual

01 dicodes 2395 / dicodes 2395T

The dicodes 2395 is an electronically controlled MOD to be used with various atomizers of different sizes and diameter. It is prepared to use one or two stacked Li-Ion batteries (type 18350/18500/18650).

The name 2395 stands for 23mm diameter and up to 95W of power.

The headpiece has a slightly bigger diameter ring so that any atomizer in the range 20 to 23mm optically fits perfect onto the device.

It has a high spring force adjustable center pin made of Copper Berrylium (hard). The dicodes 2395 can provide temperature controlled vaping with many different kinds of wire-materials (dicodes-wire, nickel, titan, stainless steel, and others). We recommend the dicodes-wire (NiFe30, RESISTERM) for optimal performance and unique liquid flavor.

The product is offered in two versions

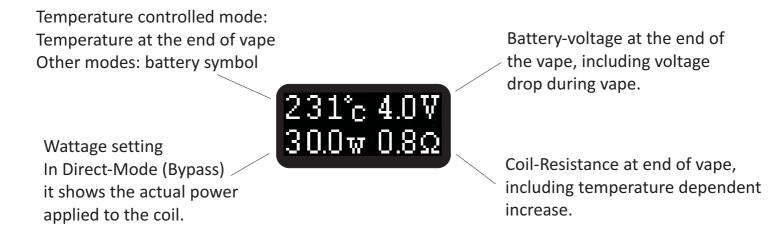
- a) with different length tube pieces to have one 18350 or 18500 or 18650 battery or two stacked batteries of (2x) 18350 or (2x) 18500 (2x 18650 is possible by using a separately offered extension tube)
- b) as a telescope version dicodes 2395T

02 Features

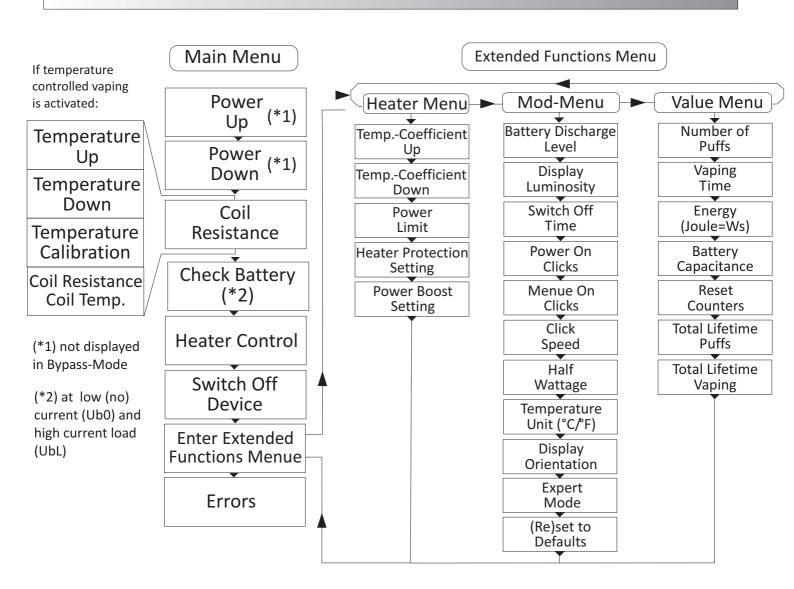
- 5 to 60W with one Li-Ion battery
- 5 to 95W with two Li-lon batteries
- Adjustable battery discharge level (2.5-3V and 6.2-6.8V)
- Up to 12V output voltage (one or two batteries)
- Up to 20A output current
- Temperature controlled vaping mode with various wire-types
- Mechanical MOD mode (protected)
- 10 Power boost modes
- 10 Heater protection modes
- Atomizer resistance range 0.05 to 5 Ohms, total
- Atomizer resistance 0.17-2.1 Ohms (60W), 0.27-1.4 Ohms (95W)
- Reverse battery protection
- Versatile menu structure
- Individual user preferences selection
- spring loaded center pin made of Copper-Berrylium
- 2Year warranty on electronic

03 Display Operation

The MOD is equipped with a graphical OLED display which provides all important informations about the status for 4 seconds after each vape.



04 Menu Overview



05 Main Menu (Page 1)





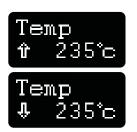
Power Up and Power Down

Power Up increases the power to the Power-Limit value and then rolls over to 5W. Power Down decreases the power down to 5W and then rolls over to the Power-Lim value. The Power-Limit value is adjusted in the Extended Functions Sub-Menu "Heater" and provides a protection feature for atomizers which are not prepared for high wattage or to reduce the power range intentionally. The wattage step size is 1 Watt below 20W, 2W between 20W and 40W and 5W above 40W, but can be set to 0.5W, 1W and 2.5W respectively in the modmenu with "Half Watt=1".

With temperature controlled vaping activated, the power setting is the maximum permitted power for the temperature regulator (do not mix this with "Power-Limit").

If the power level is smaller than the value needed to achieve the selected temperature, the operation changes from a temperature regulator to a temperature limiter. Keep this in mind in case there is poor vape and the display shows a smaller temperature than selected. If the power level is set sufficiently high, it adjusts the heating up speed of the coil until the set-point temperature is reached.

In the operation mode "Bypass" (mechanical mod), the power setting is not available, because the power is defined by the battery voltage and coil resistance. The menu items "Power Up/Down" are not displayed in this case.



Temperature Up and Temperature Down

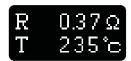
This Menu items are *only available and displayed if temperature controlled vaping is selected* (see Heater-Control menu item below). So the menu structure adapts to the selected operation mode. The Temperature Up/Down menu sets the setpoint for the coil temperature during vaping. The temperature setpoint can be selected from 120°C to 280°C (250°F- 540°F) in steps of 5°C (10°F). To achieve a high precision temperature control, a correctly performed reference measurement (TempCal Init) is mandatory, see next item.

Manual Coil Temperature Calibration



This Menu item is *only displayed if temperature controlled vaping is selected* (see Heater Control menu item below). For the use of temperature controlled vaping, the calibration measurement is a very important part of it. The Temperature calibration measures the coil resistance at room temperature (20°C) as the reference for

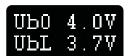
temperature controlled vaping. This, together with the wire's temperature coefficient enables the mod to calculate the coil's temperature. The calibration must be confirmed in a second step to avoid accidential activation. After confirmation the display shows "process" indicating that the calibration completed. It is important to understand, that, if the calibration is performed at a temperature other than 20°C, the control will still regulate a constant temperature, but with an offset deviation. So take the ambient temperature during the temperature adjustment into account. E.g.doing the calibration at 40°C ambient, the temperature should be set to 20°C less than normal. Similiar, if a wrong temperature coefficient was adjusted, the actual temperature might deviate dramatically from the set-point (here it is a factor and not an offset). Always perform a calibration, when a new atomizer is attached or when an atomizer is moved, e.g. when turning it.



Coil Resistance and Coil Temperature

This is a display only menu item. The coil resistance is displayed in a range from 0.00 to 9.90 Ohms. If temperature controlled vaping is selected, the current measured coil temperature is also displayed, if not, the display shows T ---. If the display does not show 20°C even with cooled down atomizer, it is recommeded to re-perform a manual calibration.

05 Main Menu (Page 2)



Battery Status

The Check Battery item shows the battery voltage with little current drained (Ub0) and the battery voltage under load during the last puff (UbL). The difference is the voltage drop within the battery and contacts. A high drop (>0.4V) indicates a poor battery or contact problems.

Please note that every battery has an inner resistance and that therefore the voltage at ist contacts always drops when current is drained. The more current is drained, the higher the drop will be. Always remember this behaviour.

Commonly used batteries of 18650 size have inner resistances of about 15mOhm up to 80mOhm. Smaller sized batteries even have higher resistances. Generally speaking, the batteries with high capacity have higher inner resistance (e.g. 2500mAh NCR has 75mOhm) and those with lower capacity also have lower inner resistance (e.g. 2100mAh Sony Konion has 15mOhm).

Heater Control (Operation modes)

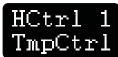


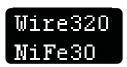
The mod can be used in up to 5 operation modes. The mode can be selected in this menu. The default operation is either standard (0, power setting) or temperature controlled vaping (1). With the "Expert Mode" (Extended Functions Mod-Menu) enabled, additional operation modes are Heater Protection (2), Power Boost (3), and Bypass (4, mechanical mod). With Expert Mode disabled, the menu options 2..4 are masked out.

0. Standard Mode

In the standard operation mode the wattage selected in the power setting menu is applied to the coil, unless the voltage would be greater than 12V or the current greater than 20A, which depends on the coil resistance. For example with a coil resistance of 4 Ohms and a power setting of 40W, the required voltage at the coil is 12.7V. With 4 Ohms the maximum wattage is 36W ((12V)²/4R=36W). Or, if the coil resistance is 0.12 Ohm the maximum power is 48W, because (20A)²*0.12Ohm=48W. As can be seen from the examples, with high coil resistance the power is limited by the maximum voltage of 12V and with low resistances by the maximum current of 20A.

The fact is also reflected in the feature list: A power of 60W is possible from 0.17 to 2.1 Ohms and 95W from 0.27 to 1.4 Ohms. Resistances of 0.05 to 5 Ohms are possible but with a reduced power.







Other

1. Temperature controlled vaping

In this mode the mod will regulate the temperature of the coil to the pre-set value, except the power setting is too low to achieve the temperature. So please note to adjust the power setting to a value high enough, if you choose temperature controlled vaping. Otherwise the temperature regulation changes to a temperature limitation mode. When Hctrl is set to 1, the menu directly jumps to the selection of the wire type. Here the user can select between dicodes-wire (NiFe30), Nickel 200, Titan, Tungsten (Wolfram), Stainless Stell (Inox) and "Other". With "Other" selected, the temperature coefficient defined in the Extended Functions Menu / Heater Menu under item "Tmp. Cof" is used. The value of the selected coefficient is displayed behind "Wire". For commonly used wires, the predefined coefficients are: NiFe30=320, Nickel200=620, Titanium=350, Tungsten=440 and Stainless Steel=105. Note that there are different alloys for Titanium and Stainless Steel on the market, so the predefined values can deviate from the actual wire-value you use.

The range for the temperature coefficient is from 100 to 650. The number describes 10 times the percentage change of a wire's resistance when the temperature rises by 100°C. For example a 10hm coil at 20°C of NiFe30 (Tmp.Cof=320) will increase to 1.32 Ohm at 120°C and 1.640hm at 220°C.

05 Main Menu (Page 3)



Parameter

Extended Functions Heater Menü



2. Heater Protection Mode (only when Expert Mode=1)

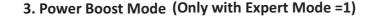
The heater protection mode is a periodic interruption of the power applied to the coil. The duration and the repetition rate of the interrupts is selected by means of the parameter "Heater Prot" in the extended functions mod-menu. The repeated power interrupt helps to avoid a break in liquid flow and thus an increase in temperature.

The table below shows the relation between power interrupt and appliance time in dependence of the parameter "Heater Prot":

Value Heater Prot	On-Time [ms]	Off-Time [ms]	Powerfactor
1	400	100	0.80
2	600	100	0.86
3	800	110	0.88
4	1000	120	0.89
5	1350	150	0.90
6	2000	200	0.91
7	2000	180	0.92
8	2000	150	0.93
9	2000	100	0.95
10	2000	80	0.96

Main Menu

Parameter





The Power Boost Mode enables an initial short term high power pulse applied to the coil (boost). The boost power is the value of the parameter "Power Limit". Beside 3 selectable initial boost lengths, further options generate a periodic boost pulse

with different length and repetition rate.

An initial boost is for quick coil heat-up. The periodic boost lets the coil temperature pass a certain range all the time. In this case different flavours within the liquid, which all develop their taste at different temperatures, are all addressed by the varying temperature.

We recommend to set the normal power (not the boost) to much lower values, when using the periodic boost, because the average power is increased by the boosts and temperature gets higher therefore.

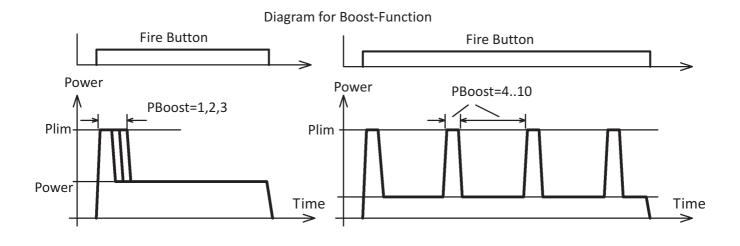
Extended Functions Heater Menu

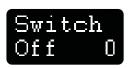


Value of Power Boost	Boost-Time [ms]	Time at Power Setting [ms]	Comment
1	300	-	Start-Boost
2	450	-	Start-Boost
3	600	-	Start-Boost
4	50	500	Periodic Boost
5	80	600	Periodic Boost
6	120	700	Periodic Boost
7	160	800	Periodic Boost
8	200	900	Periodic Boost
9	250	1000	Periodic Boost
10	300	1000	Periodic Boost

Note: If the power setting equals the power limit value, the boost has no function, as it is limited to that value as well. For a graphical diagram showing the boost operation options, please refer to the following page.

05 Main Menu (Page 4)





Switch Off Device

Beside the Auto-Power-Off feature, the user can actively switch off the device. It is recommended to switch the device off or to wait for auto-power-off, before the battery is replaced, because then the statistic counters (see below) are saved. Otherwise the changes since the last power up are lost.

To switch off the device wait on this menu item until the display of the 0 is inverted, then press the button. Note: After actively switching the device off, it can be only switched on by five short clicks.



Extended Functions Menu

The Extended Functions Menu provides three logically grouped sub-menues:

Heater Menu → Settings related to the heater or coil

Mod Menu

→ Settings related to the individual usage and appearance

Value Menu → Provides several statistics of vaping

The Extended Functions Menu offers a lot of setting options of the mod, to provide the highest possible flexibility for the user to individually adjust it to whatever preferences. Normally, once the settings were made, the user will need to change the parameter rarely. In order to keep the main menu as short as possible, the extended functions menu was created.

The many options may frighten some of the users initially. But without the extended functions menu the mod would not be able to address all different customer requirements. Please take a bit of time to get familiar with the menu. We are sure, as soon as you have gained an overview, the individual setup is a walk-over.

05 Main Menu (Page 5)



Error Messages

If an error occurs, the mod directly jumps to the error menu and displays the error number and a mnemonic (short-term) description.

The possible error messages are:

0 OvrVolt: The input voltage is too high. The dicodes 2395 is prepared for the

use of one or two batteries. If the input voltage exceeds 9V this error

message is displayed.

1 ChkAtom: No atomizer detected or open coil.

2 TempRef: A problem during the temperature reference measurement occured

Repeat the calibration procedure.

4 OverCur: Short on coil or coil breakdown (open)

5 LowBat: The battery voltage under load (with current drained from it) has reached

the minimum discharge level, defined with parameter UbatMin in the

extended function mod-menu.

6 EleHot: The electronics have heated up too much and needs to cool down. This

error will not occur with normal usage of the mod.

7 TimeOut: The maximum puff-time is limited depending on power. For a power <20W

it is 20seconds. Above 20W it decreases by 0.5seconds per Watt. And from

40W it is kept at 10seconds.

General remark on dicdes 2395

We recommend to use the dicodes 2395 with temperature controlled vaping or in boost operation mode, because in both modes the average power applied to the coil to achieve the best vaping result is most probably below the maximum power the mod can provide.

The user should keep in mind that 60W (one battery) or 95W (two batteries) continuous power drains high current from the battery(ies), and thus increases self heating of the battery(ies), the contacts and all other components, which reduces overall vaping time referred to battery capacity.

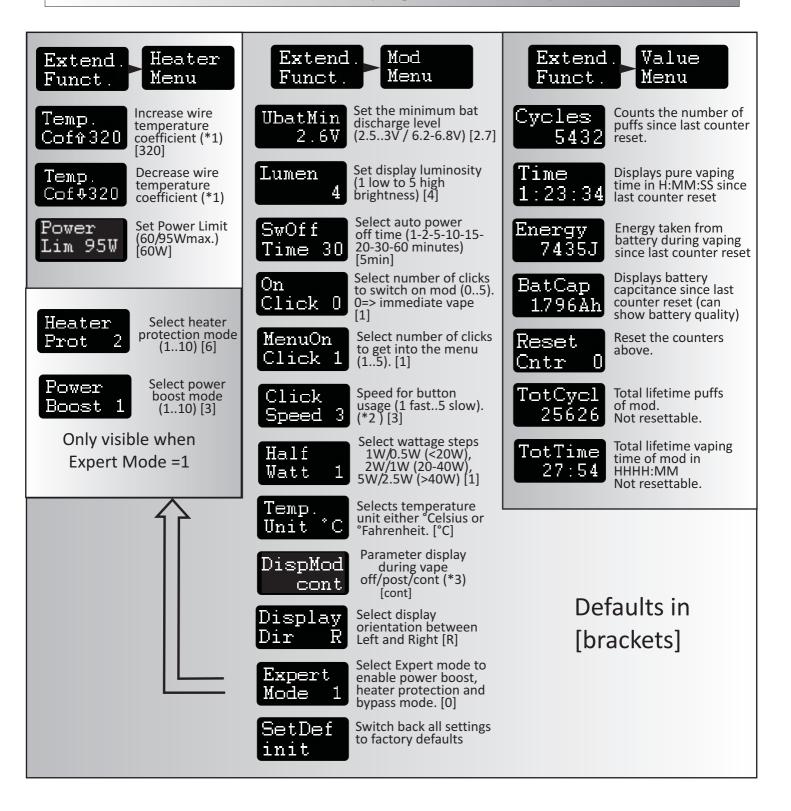
Even with the best high drain batteries available on the market, the total system power loss for example at 60W output power (single battery) will be at about 10-15W.

Note: Using two stacked batteries at high output power is always more efficient than the use of a single battery, i.e. the power loss for example at 60W using two stacked batteries is about half of the total loss using a single battery (of same size).

Big coils with a high thermal mass may require a high initial power until the coil heats up. But once it is hot, the power to keep the temperature is much lower.

In both recommended operation modes, the danger of reaching too high temperatures and the generation of hazardous substances is minimized.

06 Extended Functions Menu (Page 1: Overview)

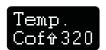


- (*1) The temperature coefficient selects the type of wire material, range 100 to 650: When TC-mode is selected (Main menu HCtrl=1), the user must select the wire type to be NiFe30 (dicodes wire), Ni200, Titanium, Tungsten (Wolfram), Stainless Steel (Inox) or "Other". The value for "Other" is adjusted here. The values of the predefined wire-types are 320=dicodes-wire, 620=Nickel, about 105=Stainless Steel, 350=Titanium (varying literature values, danger: fire harzard), 440=Tungsten (Wolfram). Value to select = Literature-value*10E5 K. Example: Ni 6.2E-3*1/K * 10E5*K => 620
- (*2) Setting 1 (fastest) same as 2 but without animation (visual shift effect), setting 5 (slowest) as 4, but without fast auto-repeat.
- (*3) When temperature controlled vaping mode is selected and with display mode=cont, the current values of "Power", "Temperature" and "Wire-Resistance" can be observed during the vape. In standard mode, the battery symbol, power and resistance is displayed. In Bypass mode the calculated power is displayed. With display mode =post these parameters are displayed after the vape with the latest values. With display mode=off, value are displayed neither during nor after the vape..

06 Extended Functions Menu

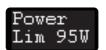
Additional Explanation to several menu items, page 1

In the following paragraphs, explanations are given for those parameters and items, which are not self explanatory or which have inter-dependencies with other parameters or functions.



The selection of the correct wire-temperature-coefficient is very important for the correct operation of the mod, when temperature controlled vaping is selected. The mod provides predefined coefficients in the main menu for wire types NiFe30

(dicodes wire), Ni200, Titanium, Tungsten (Wolfram) and Stainless Steel (Inox). If "Other" is selected as wire type, the value of this parameter is used as the temperature coefficient. The parameter can be found in the Extended functions menu/Heater Menu/TempCof. The TempCof item in the menu is visible, even if the operation mode selected is not temperature controlled vaping.

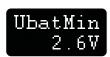


The Power Limit has an effect on several functions of the mod:

1. Power Limit defines the adjustment range of the power in the main menu. As stated in the main menu already, the limit value sets the roll-over point of the menu items

"Power Up" und "Power Down". The power limitation makes sense especially in the standard vaping mode and the use of small atomizers or coils, to avoid a coil break.

2. Power Limit sets the power during the boost-phase in the Power Boost Mode.



All dicodes devices have a functionality to adjust the minimum discharge level of the battery between 2.5V and 3.0V (single battery, older models up to 3.5V). On the 2395 and the use of two batteries, the discharge level can be set between 6.2 to 6.8V. Almost all available batteries on the market specify the minmum discharge level of

2.5V to 2.7V. For two batteries care must be taken , because theoretically one battery could be discharged to 2.5V, whereas the other still could have 4.2V. As the voltage of a fully charged battery quickly drops to 3.7V, the discharge level for two batteries is set to minumum 6.2V. If the user is unsure, whether the specific battery meets this specification, the level should be set to 2.7V or 6.4V respectively. Note that the adjustment range is automatically switched depending on the number of batteries. The selected voltage is the voltage at the poles of the battery when current is drained from it (the current drained depends on the power at the coil). In contrast to other available tube- and box-mods on the market, which stop operation already at 3.4V (or 7.0V) the lower discharge level on dicodes mods lead to a better battery utilization (up to 20%).





The time to automatic power off of the mod can be selected between 1 minute up to 60 minutes. We recommend to choose 2 or 5 minutes in conjunction with immediate vaping enabled ("OnClick"=0). This is the best utilization of the battery. In this combination, though, there is one situation to be considered: If the mod is transported in a bag, e.g., and the button is accidentially pressed all the time, it theoretically could happen that the mod exceeds the maximum vape time, error 7, goes into auto power off, is immediatle switched on again and so forth in an endless loop.

To overcome this potential problem, the mod has an implemented secure behaviour:

If "OnClicks" < 2 **AND** Error 7 (TimeOut) happened **AND** the mod has an auto-power-off, the mod can only be switched on again by pressing the button short term 5 times.

This behaviour happens only one time. Afterwards the operation is as selected by the user. The 5 OnClicks is also activated, when "Onclick"<2 **AND** the devices is actively switched off by the user (not auto-power-off).

As indicated, the OnClick range is from 0 (immediate vape) to 5. Note that the mod is always on after the first click, and then detects whether the selected number of clicks is performed in a certain time. If this is not the case, it switches off immediately.

06 Extended Functions Menu

Additional Explanation to several menu items, page 2



The display mode switches on and off the dynamic display of several parameters during the vape.

With display mode =cont (continuous) or post and temperature controlled mode, these parameters are the temperature, coil resistance, temperature regulating power and battery voltage.

For the modes standard, boost and heater protection the selected power (static, no change), the coil resistance and the battery voltage are displayed. When Bypass mode is selected, the coil resistance and battery voltage dependent, calculated power is displayed, as there is no fixed power setting in bypass mode. Withdisplay mode =cont the value are displayed during and after the vape, with "post" they are display only after the vape.

When display mode =off the display is off during and after the vape..



The dicodes 2395 can be used in 5 different modes. But in order to keep the menu as short and simple as possible, 3 of the 5 modes are only available, if the Expert-Mode is set to 1. The name is Expert-Mode, because the use of the additional operation modes requires additional knowledge about their functionality.

The additional modes available with Expert Mode set to 1 are "Power Boost", "Heater Protection" and "Bypass".

Here again the modes in an overview:

- Standard: Vaping with a constant power setting. The selected power is applied to the coil, unless the coil's resistance affords a different power setting.
- Temperature The power applied to the coil is calculated by a temperature controller, which keeps the Control: coil's temperature constant. Important to note: Set the right temperature coefficient and perform a calibration at room temp.
- Heater The power to the coil is repetively interrupted to enable a liquid flow und to limit the Proection: temperature.
- Power Boost: The coil is quickly heated up initially. Moreover an repetitive boost can be selected. Note to not to set the power limit to a value too low and use lower normal power setting.
- Bypass: The mod behaves like a mechanical mod, i.e. the battery voltage is directly applied to the coil, with the restriction, that the maximum current is limited to 20A. Note that the vape now depends on the charging level of the battery.

06 Extended Functions Menu

Additional Explanation to several menu items, page 3



The Extended Functions Menu has another sub-menu showing several statistical values. There are two types of value-counters, either re-settable to zero or not.

The statistic counters are saved whenever the mod is automatically or manually switched off. In contrast, if the battery is removed from the mod before switching off, the changes of the counters since the last switching on are lost.

Cycles

 Γ ime

BatCap 1.796Ah

Reset

 ${\sf TotCycl}$

 ${\tt TotTime}$

The following statistical values are stored:

- Cycles Number of puffs. The counter can be reset to 0.

- Time The timespan during which power was applied to the coil, i.e. vaping time. The counter can be reset to 0.

This is the energy consumption during vape in Joules=Watt-Seconds. This - Energy value is the true integrated vape power over time. It is the power integral, because during temperature controled vaping (and also in bypass mode) the power is not constant, but varies a lot over time due to the regulation. The counter can be reset to 0.

This is a quite interesting counter: If it is reset imemdiately after the insertion - BatCap of a fully charged battery, and checked before a new battery is inserted, it shows the batteries capacity. With this function the user can check, whether the battery has a capacity as declared by the manufacturer or whether the battery is wear-out. This counter can be reset to 0.

"Total Cycles" is the number of puffs throughout the entire mod's life. - TotCycl It cannot be reset.

- TotTime "Total Time" is the total time of vaping (not stand by) in a format HHHH:MM that is 4digits of hours and 2 for minutes. It cannot be reset.

The menu item **Reset Cntr**, i.e the resetting of the counters, is intentionally positioned between resettable counters and thos which cannot be reset. So it is easier to remember, which are reset.

Remarks about stacking

The dicodes 2395 detects the number of batteries by itself and changes the ranges of parameter Ubat, min (minimum discharge level) and power limit (60W/95W) automatically.

The efficiency of the system, that is battery and mod, is higher when using two batteries instead of one. In other words the total vape time of a stacked-batteries mod is somewhat longer than two times the vape time of a single-battery mod. This is because the currents at the same power output is half for two batteries compared to one. Example: A current drained from the battery of 10A, with an inner resistance of 70mOhms generates a power loss of 7W during vape. A current of 5A from two batteries (both 70mOhm) generates a power loss of just 3.5W distributed to two batteries! Moreover the voltage drop which increases the current needed for the same output power is half.

07 Warrany and Disclaimer

Warranty

All devices produced by dicodes must pass extensive electrical tests, calibrations and optical inspections before being packed and shipped. If nevertheless an erroneous operation is detected, dicodes will take care about within two years after purchase. The customer is therefore requested to keep the invoice. The warranty refers to the error free operation of the electronics hardware and software during normal use.

In case the device shows a permanent electric fail or if a software bug is detected, the user is free to send the device back to dicodes for repair without cost. The customer is requested to check the devices housing for scratches or marks, prior to any use. Company dicodes cannot accept claims after any use of the mod. In the case the customer is not sure whether the malfunction is covered by the warranty, please contact dicodes by email prior to sending back the device. If a sent back defective device is not covered by the warranty, dicodes will give the customer a quote for repair, before any repair action takes place. The postal fee or shipping charge from the customer to dicodes is not covered by the warranty in any case.

Please send the device to:

dicodes GmbH

Friedrich der Grosse70

D-44628 Herne, Germany

Our email address is: info@dicodes-mods.de

The warranty does not cover:

- defects or fails due to misuse, contamination by liquid or dirt, damage, tampering, lack of care, exposure to temperatures higher than 45°C or lower than 0°C
- scratches or marks due to normal wear and use
- defects due to the use of faulty or incorrect batteries

The warranty voids, when:

- dropping the device on the floor (*)
- attempting to open or opening the device
- maintaining or repair by unauthorized persons
- (*) Do not use a device which dropped, because the electronic could be damaged. Contact dicodes.

07 Remarks and Notes

Battery

Always use batteries with high drain current or very high current capability. Avoid to use no-name products. Insert the battery with the plus terminal in the direction towards the atomizer and in angular position.

Electronic cigarettes

Electronic cigarettes are NOT healthy. But so far all studies indicate, that they are less harmful compared to tobacco- cigarettes.

Electronic cigarettes are an alternative to tobacco-products, but should not be regarded as an dehabituation to smoking.

Electronic cigarettes are not suited for children and youngster below 18years of age, non-smokers, pregnant women, persons with allergies against Nicotine, Propylene Glycol and persons with cardiovascular disease. Selling to persons below 18years of age prohibited!

Battery Disposal

You bought a rechargable battery powered product. The rechargable battery lasts long, but wears out nevertheless. Li-Ion batteries may not be disposed in houshold waste. Customers are obligated by law to dispose wear out batteries to apporiate gathering points.

Mod Disposal

The symbol below indicates that this product should not be treated as household waste, but according to WEEE (waste electrical/electronical equipment) should be reused or recycled.

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Germany

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Errors excepted. Subject to changes without prior notice.