digital controlled devices

dicodes

Dani Box V2   Dani Box Mini

manual

01 Dani Box V2 and Dani Box Mini

The **dicodes Dani Boxes** are electronically controlled MODs to be used with various atomizers of different sizes and diameters of 24mm and smaller. Mechanically the Dani Box V2 is identical to the former Dani Box (V1) and the difference between Dani Box V2 and Dani Box Mini is the form factor. The Mini was designed to attract users, who prefer very small devices.
Both Mods are powered by one battery of size 18650.
They have a very ergonomic soft touch design and are equipped with
three buttons on the long side for menu operations and firing, a high brightness OLED display on the top and a sophisticated construction of an adjustable center pin made of copper beryllium.
The bodies are manufactured from high quality anodised aluminum and are offered in several colors. The head and bottom pieces are made of solid stainless steel.
Here, the V2 provides a satin-finish, whereas the Mini's surface shows a brushed stainless steel appearance.
Electrically, the **Dani Boxes** allow vaping with up to 80W and, beside 4 different operation modes, 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, RESISTHERM) for optimal performance and unique liquid flavor.
By means of a separately purchasable charging station, the battery can be charged inside the mod with up to 2A charging current.

Both box mods provide several safety-features referring to their high power capability. Beside the limitation of the output current and output voltage, the mods are continously checking the input voltage and current and limit the output power accordingly, to always keep the system in a safe condition.
As part of this safety concept, the system's source resistance is determined, i.e. the combined resistance of the battery, contacts and internal wiring. Please see chapter 3 for further information.

02 Feature List

- 5 to 80W with one Li-Ion battery size 18650
- Adjustable battery discharge level (2.5-3V)
- Up to 11V output voltage
- Up to 22A output current
- System source resistance determination
- Temperature controlled vaping mode with various wire-types
- Mechanical MOD mode
- 10 Power boost modes
- 10 Heater protection modes
- Atomizer resistance range 0.05 to 5 Ohms, total
- Atomizer resistance range at 80W 0.17-1.5Ohms
- Reverse battery protection
- Versatile menu structure
- Individual user preferences selection
- spring loaded center pin made of copper beryllium
- charging contact on the bottom (requires charge holder)
- 2 Years warranty (terms and conditions, see chapter 07)
- stable stainless steel / anodized Aluminium housing

03 Display Operation

The mods are equipped with a graphical OLED display which provides all important information about the status during and for 4 seconds after each vape.

Temperature controlled mode:
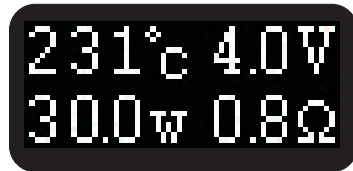Temperature during vape
Other modes: battery symbol

Battery-voltage during the vape, including voltage drop.

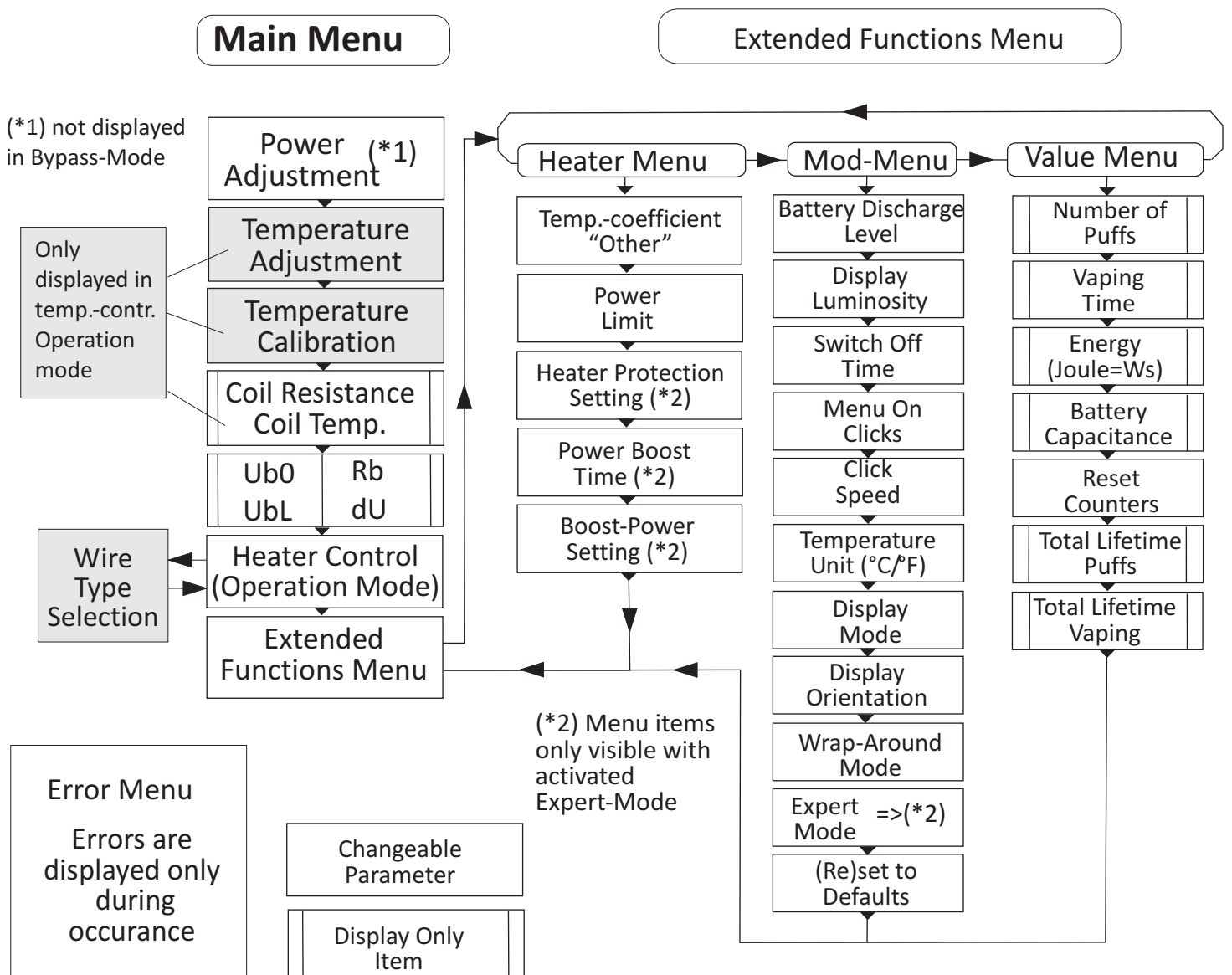231°c 4.0V
30.0w 0.8Ω

Wattage setting
In Direct-Mode (Bypass) it shows the actual power applied to the coil.

Coil-Resistance during vape, including temperature dependent increase.

04 Menu Overview

Main Menu

Extended Functions Menu

(*1) not displayed in Bypass-Mode

Power Adjustment (*1)

Only displayed in temp.-contr. Operation mode

Temperature Adjustment

Temperature Calibration

Coil Resistance Coil Temp.

Ub0	Rb
UbL	dU

Wire Type Selection

Heater Control (Operation Mode)

Extended Functions Menu

Heater Menu	Mod-Menu	Value Menu
Temp.-coefficient "Other"	Battery Discharge Level	Number of Puffs
Power Limit	Display Luminosity	Vaping Time
Heater Protection Setting (*2)	Switch Off Time	Energy (Joule=Ws)
Power Boost Time (*2)	Menu On Clicks	Battery Capacitance
Boost-Power Setting (*2)	Click Speed	Reset Counters
	Temperature Unit (°C/°F)	Total Lifetime Puffs
	Display Mode	Total Lifetime Vaping
	Display Orientation	
	Wrap-Around Mode	
	Expert Mode =>(*2)	
	(Re)set to Defaults	

(*2) Menu items only visible with activated Expert-Mode

Error Menu

Errors are displayed only during occurance

Changeable Parameter

Display Only Item

Switching On/Off, Key Locking and Menu-Operation

The dicodes boxmods have three buttons: The bigger vape/fire button positioned directly below the atomizer and a plus- and minus button below the fire button. The mod is switched on by shortly pressing any button 5 times. The display shows "Hello" and the user is led to the main menu. For actively switching off the mod the fire button is to be pressed shortly 5 times and the display shows "Bye.." Important Note: The dicodes boxmods differentiate between active switch off and the automatic switch off after the switch-off-time. When the mod was switched off driven by the automatic timer, the menu is entered by clicking MonClk (Menu On Clicks) times the plus or minus button or by pressing the vape-button longer for immediate vaping. I.e. the user can vape immediately, even when the mod was completely powered down.

To avoid an unintended change of settings, for example during transportation in a pocket, the buttons can be locked by pressing the plus- and minus button simulteanously: "KeyLock" is displayed. To unlock the buttons, agagin both buttons need to be pressed at the same time, indicated by "UnLock" shown on the display.

By means of the plus and minus buttons it is possible to navigate through the menu, as well as to increase and decrease values of a parameter after a short waiting until the value is displayed inverted (black on white). The waiting time from navigation mode to the entry mode is adjustable by means of the parameter "Speed" in the extended functions menu.

Beside waiting, it is also possible to get from navigation to value entry mode (and back) by **shortly** pressing the fire button, i.e. skipping the waiting time. Thus a quick change of adjustments is possible.

In the extended functions menu, the short pressing of the fire button also enables the fast stepping between the selection of one of the three different sub menues, again skipping the waiting time until the desired menu is displayed. At this point the fire button also acts as an escape option from the extended funtions menu, by holding the button for a longer time and releasing it. Note that during the extended functions menu display vaping is disabled.

Changing the Power Setting

In the Power menu the power setting can be changed by means of the plus/minus buttons in steps up to the Power-Limit (PLim) value or down to 5W repectively. If the wrap-around is activated, the setting rolls over at the PLim/5W border. When wrap-around is disabled, further increase or decrease is blocked at the borders.

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 0.5 Watt below 30W and 1W above.

In the operation mode "Bypass" (mechanical mod), changing the power setting is not available, because the power is defined by the battery voltage and coil resistance. The menu "Power" is not displayed in this case, but the value display during and after the vape shows the actual power output to the coil.

With temperature controlled vaping activated, the power setting is the power limit for the temperature regulator. 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. If the power level is sufficiently high, it sets the heating up speed of the coil until the set-point temperature is reached.

When the battery voltage decreases, power is reduced starting from the voltage set by the parameter Ubat,min (EF-mod menu) plus 0.7V and ending at 10W at Ubat,min. E.g. UbatMin=2.6V and Power=60W => Full 60W until battery voltage is at 3.1V, and then reduced to 50W at 3.0V, 40W at 2.9V and so forth. When the power is reduced, the battery symbol on the display will toggle with the message "LOW" and the reduced power level is show. Typical settings for Ubat,min are between 2.5 and 2.7V.

Setting the Temperature

This Menu item is ***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.
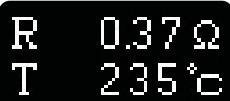
Manual Coil Temperature Calibration

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" until the calibration completed. It is extremely important to understand, that, if the calibration is performed at a temperature other than 20°C, the control will regulate a constant temperature, but with an offset deviation. So take the ambient temperature during the temperature adjustment in to account. 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, even if it is made from the same coil material.

For further information about this topic, please read the "Appication Note for Temperature Controlled Vaping", available on the dicodes-mods website.

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 measured/calculated coil temperature is also displayed, if not, the display shows T ---.

Note that the display will be continously updated, if the plus or minus button is kept pressed after the values have been highlighted (or inverted). This can help during problem diagnoses .

In TC-mode, if the display does not show 20°C after calibration, even with a cooled down atomizer, we recommeded to perform the calibration again.

Note that for coils with very low resistance, like Nickel-coils, a slight mechanical rearrangement (tightening the atomizer) can lead to drastical changes in the temperature control due to the change of contact resistances. We therefore rcommend to use other than Nickel coils, e.g. The NiFe30 (RESISTHERM) wire from dicodes.

Battery Status Part1

```
Ub0 4.0V
UbL 3.7V
```

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 of the battery (dU). A high drop (e.g. dU>0.4V@20W and dU>0.7V@60W) indicates a poor battery and/or contact problems.

Please note that every battery has an inner resistance and that therefore the voltage at it's 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 $18m\Omega$ up to $80m\Omega$. Smaller sized batteries even have higher resistances. Generally speaking, the batteries with high capacity have higher inner resistance and those with lower capacity also have lower inner resistance.

Battery Status Part2

```
Rb   24mΩ
dU  117mV
```

The Dani Box V2 and the Dani Box Mini now have an additional feature supporting the user to evaluate the quality of the battery and the system contacts on the battery side. This feature is gaining importance especially when vaping at very high powers, i.e. between about 50-80W.

When at the display menu item of Ub0 and UbL described above, the mod will display the system's source resistance Rb and a more accurate measurement of the voltdrop Ub, as soon as the values of Ub0 and UbL are highlighted and the plus- or minus-button is pressed. Every time a button is pressed then, the display will toggle between the values of Ub0/UbL and Rb/dU.

Note that these values might change a bit when toggling back and forth, because the battery voltage without load (Ub0) can change, mainly due to the temperature change (cooling) after vaping.

The systems source resistance is the sum of the batteries inner resistance as the main contribution and all contact and wiring resistances of the device. As already stated, typical battery resistances vary from $18m\Omega$ to $80m\Omega$ depending on the type. The typical contact and wiring resistance of the dicodes boxes sum up to about $6m\Omega$.

At high power, the current drained from a battery will lead to a <u>significant</u> voltage drop at the systems source resistance. The by far biggest part of the voltage drop is created INSIDE the battery and NOT in the device. Please keep this always in mind.

The diagram below shows the voltage drop depending on the source resistance based on a battery fully charged to 4.2V. When the battery is not fully charged the drop will increase even more, because of the increasing current needed to provide the same ouput power.
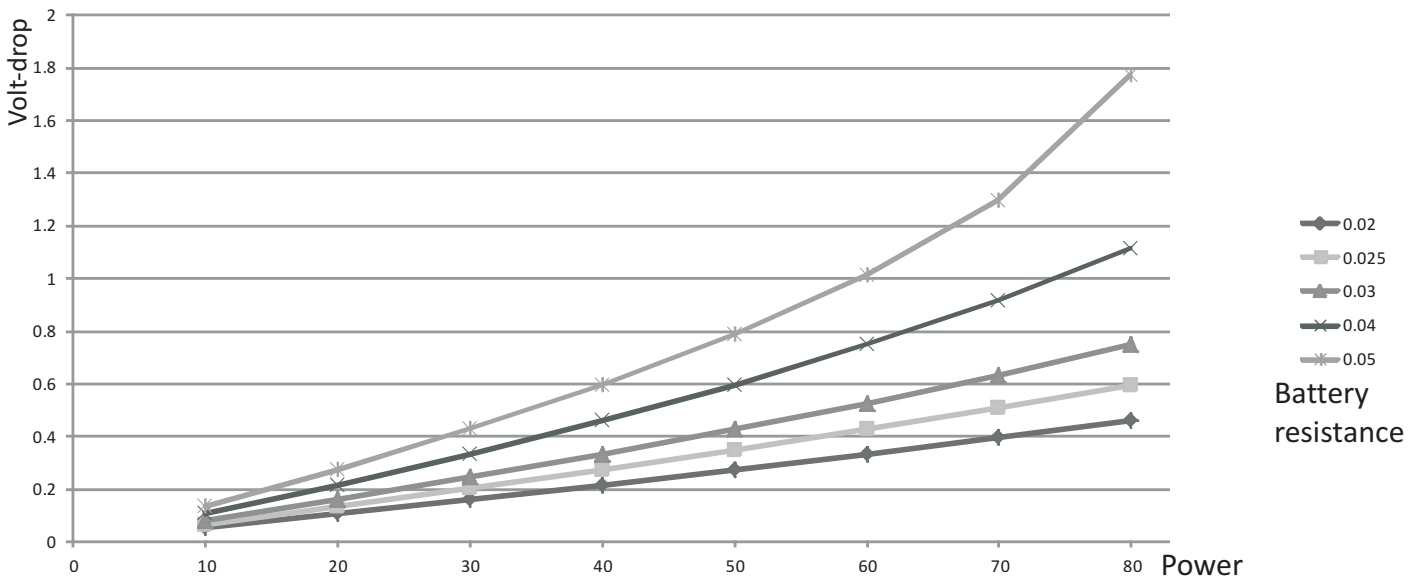
Notes about very high power vaping

When vaping at high power it is strongly recommended that only the best in class batteries are used and that all contacts are kept clean. Always keep in mind that 80W taken even from a high drain battery wil create power losses in the batteries inner resistance as well as at all mechanical contacts, which finally will reduce the total vape time and lead to volt drop. The power-losses inside the battery can be significant as a simple calculation shows:

Example (neglegting efficiency of electronic):

Inner battery resistance 25mΩ

Voltage at battery under load 3.3V $\quad\quad$ Power-loss,battery = $(80W/3.3V)^2 * 25m\Omega = 15W$

Output Power 80W $\quad\quad\quad\quad\quad\quad\quad\quad\quad$ (20% of output power)

We strongly recommend to use the boost-mode for (boost-)powers of >60W or to use the TC mode.
This will prevent to overheat the liquid and help avoiding the creation of hazardous substances.

The box is equipped with different kinds of power reduction mechanisms to keep the operation in a safe region for the battery and the electronic. If the power is reduced, the actual power output is displayed instead of the setpoint.

1. The output current is limited to 22A: When the atomizer or coil resistance is comparably low and when the power is set to high values, the actual output power will be limited according to the formula
Pout<= Imax^2* Rcoil
Example: Rcoil=0.12 Ω=> Pout,max= $(22A)^2*0.12\Omega$ = 58.8W, regardless of the power setting (unless it is lower than 59W)
The limitation works dynamically, i.e. if the wire changed (e.g. a TC-wire), the limitation will adapt to this.

2. The output voltage is limited to 11V: When the atomizer or coil resistance is high, power is limited according to
Pout<=Umax^2/Rcoil
Example: Rcoil=1.8Ω => Pout,max=$(11V)^2/1.8\Omega$ = 67.2W
The limitation works dynamically. For example when using a TC-wire the initial power can be very high and as soon as the wire is hot, the power will be reduced.
Remark: This behaviour can theoretically be used as a pseudo TC-mode avoiding the calibration procedure.

3. The output power is limited if the source resistance (battery inner resistance including contact resistances and internal wiring) is higher than 30mΩ.

4. The output power is reduced when the battery voltage drops to a value dependent of parameter Ubat,min (range 2.5 to 3.0V) according to the formula
Pout,max= the lower of [80W and 10W+(UbL-Ubat,min)*10W/0.1V]
Example: Ubat,min=2.5V, UbL=3.15V (battery voltage including drop during power output)
 => Pout,max = 10W+ (3.15-2.5)V*10W/0.1V = 75W
Note that the power is less reduced, when the battery inner resistance is low. Also note that power is reduced only if the battery voltage drops below 3.2V (at Ubat,min=2.5V)

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 power (0) 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.

```
HCtrl 0
Power
```

0. Power Mode
In the power operation mode the wattage selected in the power setting menu is applied to the coil, unless the voltage would get greater than 11V or the current greater than 22A, which depends on the coil resistance.

For example with a coil resistance of 2 Ohms and a power setting of 80W, the required voltage at the coil is 12.6V. So with 2 Ohms the maximum wattage is 60.5W ($(11V)^2/2R$=60.5W).
Or, if the coil resistance is 0.1 Ohm the maximum power is 48.4W, because $(22A)^2*0.1Ohm$=48.4W.
As can be seen from the examples, with high coil resistance the power is limited by the maximum voltage of 11V and with low resistances by the maximum current of 22A. The fact is also reflected in the feature list: A power of 80W is guaranteed from 0.17 to 1.5 Ohms.
Resistances of 0.05 to 5 Ohms are possible but with a reduced power.

1. Temperature controlled vaping

```
HCtrl 1
TmpCtrl
```

```
Wire320
NiFe30
```

⋮

```
Wire280
Other
```

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 (Ni), Titanium (Ti), several sorts of stainless steel, NiFe48 and "Other". With "Other" selected, the temperature coefficient defined in the Extended Functions / Heater Menu under item "Tmp. Cof" is used. The value of the selected coefficient is displayed behind "Wire".

For commonly used wires, the predefined coeffcients are: NiFe30=320, Nickel200=620, Titanium=350, SS304=105, SS316=88, SS316L=92 and NiFe48=480. 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. In these cases it is preferable to choose "Other" as the wire type and set the value of the wire in the extended functions heater menu "TempCof". The range for the coefficient is 050 to 650.

If you use the dicodes wire (RESISTHERM) it is guaranteed that the wire will always have the same coefficient, because the wire was especially designed for temperature regulation purposes. The regulation accuracy is best then, as the combination of resistivity and high coefficient is very good.
Note for using Nickel wire: Nickel has a high and always precise temperature coefficient (Ni200). But Nickel is not so easy to handle, because it is quite soft and it leads to very low resistance coils, because of it's high conductivity. For the regulation accuracy smallest changes of contact resistances due to atomizer movements (tightening) or mechanical thermal elongations lead to poor regulation accuracy.

Main Menu

```
HCtrl 2
HtrProt
```

Parameter

Extended Functions
Heater Menu

```
Heater
Prot  2
```

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

3. Power Boost Mode (only when Expert Mode =1)

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.

Main Menu

```
HCtrl 3
P-Boost
```

Parameter

Extended Functions
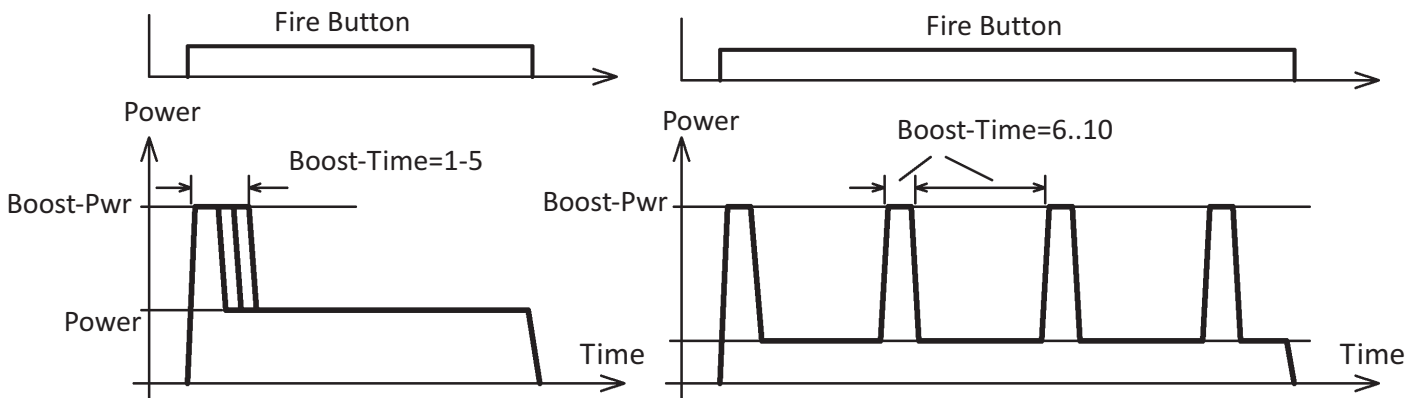Heater Menu

```
Boost
Time 3
```

```
Boost
Pwr 50W
```

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.

Wert Boost Time	Boostzeit [ms]	Zeit auf Nennleistung [ms]	Effektive Leistung (bei 5W Nennleistung)
1	300	-	Start-Boost
2	450	-	Start-Boost
3	600	-	Start-Boost
4	800	-	Start-Boost
5	1000	-	Start-Boost
6	100	700	6.9
7	150	800	7.17
8	200	900	7.36
9	250	1000	7.6
10	300	1000	8.0

Diagram for Boost-Function

Extended Functions Menu

```
Extend.
Funct.
```

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.

```
ErrNo 1
ChkAtom
```

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 Dani Boxes are prepared for the use of one battery. If the input voltage exceeds 4.5V this error message is displayed. Reduce the input voltage to the specified range.

1 ChkAtom: No atomizer detected or open coil.

2 TempRef: A problem during the temperature reference measurement occured

3 N/A

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 20 seconds. Above 20W it decreases by 0.5seconds per Watt, above 40W it is 10seconds.

8 LowR: In Bypass mode the coil resistance is too low.

Extend. Funct. → Heater Menu

Change wire temperature coefficient of "Other" wire (*1)
Default 320

`Temp. Cof⇕320`

Set Power Limit (80Wmax.)
Default 80W

`Power Lim 40W`

Select heater protection mode (1..10)
Default 6

`Heater Prot 2`

Select power boost time (1..10)
Default 3

`Boost Time 3`

Select power boost power (1..10)
Default 50W

`Boost Pwr 50W`

Only visible when Expert Mode =1

Extend. Funct. → Mod Menu

Set the minimum bat discharge level (2.5..3V)
Default 2.7V

`UbatMin 2.6V`

Set display luminosity (1 low to 5 high brightness)
Default 4

`Lumen 4`

Select auto power off time (1-2-5-10-15-20-30-60 minutes)
Default 5min.

`SwOff Time 30`

Select number of clicks to get into the menu (1..5).
Default 1

`MenuOn Click 1`

Speed for button usage (1 fast..5 slow). (*2)
Default 3

`Click Speed 3`

Selects temperature unit either °Celsius or °Fahrenheit.
Default °C

`Temp. Unit °C`

Parameter display during vape off/post/cont (*3)
Default cont

`DispMod cont`

Select display orientation between Left and Right (handed)
Default R

`Display Dir R`

Wrap around (roll over or stop at min/max)
Default 1

`Wrap Mode 1`

Select Expert mode to enable power boost, heater protection and bypass mode.
Default 0

`Expert Mode 1`

Switch back all settings to factory defaults

`SetDef init`

Extend. Funct. → Value Menu

Counts the number of puffs since last counter reset.

`Cycles 5432`

Displays pure vaping time in H:MM:SS since last counter reset

`Time 1:23:34`

Energy taken from battery during vaping since last counter reset

`Energy 7435J`

Displays battery capcitance since last counter reset (can show battery quality)

`BatCap 1.796Ah`

Reset the counters above.

`Reset Cntr 0`

Total lifetime puffs of mod.
Not resettable.

`TotCycl 25626`

Total lifetime vaping time of mod in HHHH:MM
Not resettable.

`TotTime 27:54`

(*1) The temperature coefficient selects the type of wire material in the range 050 to 650: When TC-mode is selected (Main menu HCtrl=1), the user must select the wire type to be NiFe30 (320, dicodes wire), Ni200 (620), Titanium (350), SS304 (105, V2A), SS316 (88), SS316L (92), NiFe48 (480) or "Other". The value for "Other" is adjusted here. Value to select = Literature-value*10E5 K. Example: Ni 6.2E-3*1/K * 10E5*K => 620

(*2) Setting 1 (fastest) up to3 without animation (visual shift effect), setting 4 slowest with shift animation

(*3) When temperature controlled vaping mode is selected and with diplay mode=post/cont, the current values of "Power", "Temperature" and "Wire-Resistance" can be observed 4 seconds after/during the vape. In power mode, the battery voltage, power and resistance is displayed. In Bypass mode the measured power is displayed. With display mode = off no parameters are displayed after or during the vape

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.

```
Temp.
Cof⬍320
```

The selection of the correct wire-temperature-coefficient is very important for the correct operation of the mod, when temperature controlled vaping is selected.
As soon as TC-mode is selected, a multiple choice list of commonly used wires types with predefined coefficients is displayed and the wire type "Other".

The coefficient of this "Other" wire is adjusted in this menu item. Note that stainless steel wires and also titanium wires often have not well defined coefficients, depending on their exact alloy composition. The TCoef item in the menu is visible, even if the operation mode is not selected to temperature controlled vaping.
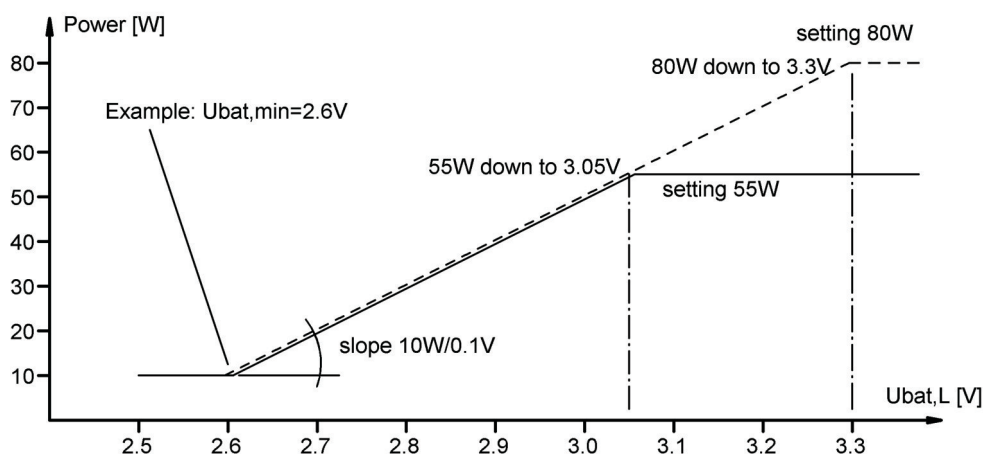
```
Power
Lim 40W
```

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 or stop point of the menu "Power". The power limitation makes sense especially in the power vaping mode to reduce the range to the used atomizer.

```
UbatMin
2.6V
```

All dicodes devices have a functionality to adjust the minimum discharge level of the battery between 2.5V and 3.0V (older models 3.5V). Almost all available batteries on the market specify the minmum discharge level of 2.5V to 2.7V. If the user is unsure whether her/his specific battery meets this specification, the level should be set to 2.7V.

The selected voltage is the voltage at the electronics input, when current is drained from the battery (Ub,L). In contrast to other available tube- and box-mods on the market, which stop operation already at 3.4V, the lower discharge level on dicodes mods lead to a better battery utilization.

Power [W]

setting 80W
80W down to 3.3V
Example: Ubat,min=2.6V
55W down to 3.05V
setting 55W
slope 10W/0.1V
Ubat,L [V]

2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3

At UBatMin+ 0.7V a power reduction is activated depending on the actual power setting. The reduction starts when the power selected hits the slope from Ubat,min@10W to Ubat,min+0.7V@80W as show in the diagram above.

```
SwOff
Time 30
```

The time to automatic power off of the mod can be selected between 1 minute up to 60 minutes. We recommend to choose 1 or 2 minutes, because the mod is always immediately on and ready to vape, when the fire button is pressed. This provides the best utilization of the battery. When off, the device draws zero current from the battery.

Note that if the mod was actively switched off by the user (5 times fast clicking of the fire button), the instant power on is not available. In this case the mod has to be switched on with 5 clicks first.

`DispMod cont`

The display mode switches on and off the dynamic display of several parameters during and after the puff. The setting "cont" (continous) will display values during and 4 seconds after the vape. With "post" the values are displayed only after the puff and off disables the display.

The values shown depend on the operation mode: In temperature controlled mode, the parameters are the temperature, coil resistance, temperature regulating power and a battery symbol.

For the modes power, boost and heater protection, the selected power (or limited power in case), the coil resistance and the battery voltage are displayed. When Bypass mode is selected, the coil resistance and the battery voltage dependent, measured power is displayed, as there is no fixed power setting in bypass mode.

`Expert Mode 1`

The dicodes Dani Boxes 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:

Mode0 Power	Vaping with a constant power setting. The selected power is applied to the coil, unless the coil's resistance affords a different power setting or power is limited due to other reasons..
Mode1 Temp-Cont.	The power applied to the coil is calculated by a temperature controller which keeps the coil's temperature constant. Important to note: Set the correct temperature coefficient and perform a calibration at room temp.
Mode2 Heater-Prot.	The power applied to the coil is repetively interrupted to enable a liquid flow und thus to limit the temperature.
Mode3 Power-Boost	The coil is quickly heated up initially. Moreover an repetitive boost can be selected. We recommend not to set the boost-power value too low but adjust a lower normal power setting to limit the coils temperature rise.
Mode4 Bypass	The mod behaves like a mechanical mod, i.e. the battery voltage is directly applied to the coil. This, with the restriction, that the maximum current is 22A. Note that the vape now depends on the charging level of the battery, and the coil should not be too low in resistance as then 22A is the limiting factor. If the resistance is too low in Bypass-mode, Err8 LowR is displayed and vaping is not possible.

`SetDef init`

With "Set Defaults" it is possible to reset all settings to the delivery status. The reset is initiated by selecting the menu an pressing a button. To avoid unintended resetting the user has to confirm the procedure by again pressing the button when "confirm" is displayed. "Process" shows that the rest is performed.

Most of the defaults are listed in the overview diagram of the Extended Functions Menu.

Those settings missing there are:

Power:	10W
Temperature:	210°C
Heater Control Mode:	0 (Power, normal VW)
Wire Type:	NiFe (320)

Value Menu

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 5432

Time 1:23:34

Energy 7435J

BatCap 1.796Ah

Reset Cntr 0

TotCycl 25626

TotTime 27:54

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.
- Energy   This is the energy consumption during vape in Joules=Watt-Seconds. This 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.
- BatCap   This is a quite interesting counter: If it is reset imemdiately after the insertion 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.
- TotCycl   "Total Cycles" is the number of puffs throughout the entire mod's life. 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.

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.

08 Remarks and Notes

Battery
Always use batteries with high drain or very high current capability, flat top, unprotect from high quality manufacturers. Avoid to use no-name products. Using low quality batteries will void the warranty. Insert the battery with the plus terminal in the direction towards the atomizer and in angular position.

Warranty
Opening the device, other than the battery cap, to change the battery, will void the warranty!

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. Thank You!

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