Evolv DNA 80C

80 Watt Variable Power Module with Temperature Protection and USB

The DNA 80C is a power regulated digital switch-mode DC-DC converter for personal vaporizers. It features Evolv's patented Wattage Control, Boost, Replay, Full Color TFT Screen, Reverse Polarity Protection, and waterproof onboard buttons. The USB-C port, Evolv's EScribe software and Theme Designer software can be used to customize some aspects of the interface or monitor the user experience. The DNA 80C runs from a single lithium polymer or lithium ion battery, and features battery monitoring and integrated 3A charger.

Specifications

	Minimum	Typical	Max
Output Power	1 Watt		80 Watts
Output Voltage	.2 Volt		9.0 Volts
Output Current, continuous			30.0 Amps
Output Current, instantaneous peak			30.0 Amps
Input Voltage	3.0 Volts	3.7 Volts	4.5 Volts
Input Current	.5 Amps	15.0 Amps	30.0 Amps
Input Current, pulse			30.0 Amps
Screen On Current		20mA	
Quiescent Current		2mA	
Power Down Current			20uA
Efficiency		90%	
Weight		15.2g	
Footprint	1.181” x .906”		30mm x 23.5mm
Thickness		.34”	
Screen size		128 x 128px	Color TFT

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Operation

Basic operation of the DNA 80C is as follows. To wake the device from power off state, tap the Fire button. To generate vapor, press the Fire button. To change the wattage setting for more or less vapor, navigate to the wattage setting, highlight it with the Fire button, adjust it with the Up and Down buttons, and press the Fire button again to confirm.

Pressing the fire button five times with less than .7 seconds between presses will cause the device to enter Locked mode. In Locked mode, the device will not fire and the output power will not adjust accidentally. While in Locked mode, the screen will be off, except that pressing a button will show "Locked, Click 5X". To exit Locked mode, press the fire button 5 times.

Display

The DNA 80C has a full color 128 x 128 px TFT screen. The screen is attached to the main board by a flexible cable, allowing freedom in the design of your device. The screen's default position is on top of the board, between the fire and adjust buttons. This allows for easy assembly. The screen connects to the board with a ZIF connector, so alternate placement is possible. Please use caution when handling the screen and design the device so that the cable will be secured or strain relieved in operation

Watt setting: The power level currently set on the DNA 80C.

Replay Setting: Replay is a new feature only on DNA boards. Replay is intended to capture the flavor and satisfaction of the "perfect puff" and provide the same level of performance and consistency on all subsequent puffs. The use of Nickel, Stainless, Titanium, or other material that increases in resistance when heated is required. In addition, Replay will also prevent dry hits when used with wattage control.

To use Replay set the device to the desired power level and operate it normally. Once a satisfying puff is achieved, activate the feature to save and replay the saved puff each time the device is fired. Puff length is not a factor and the user will not be limited to the length of the previous puff. Disable Replay to resume normal operation or find a new puff to save. If Replay can be utilized with your coil, the screen will display "Replay Ready".

Battery indicator: The current state of charge of the battery.

Ohms display: The resistance of the atomizer attached to the device.

Modes

Locked mode: Pressing the fire button five times with less than .7 seconds between presses will cause the device to enter Locked mode. In Locked mode, the device will not fire and the output power will not adjust accidentally. While in Locked mode, the screen will be off, except that pressing a button will wake the screen. To exit Locked mode, press the fire button 5 times.

Error Messages

The DNA 80C will indicate a variety of error states.

Check Atomizer: The DNA does not detect an atomizer, the atomizer has shorted out, or the atomizer resistance is incorrect for the power setting.

Shorted: The atomizer or wiring are short circuited.

Weak Battery: The battery needs to be charged, or a higher amp rated battery needs to be used. If this happens, the DNA 80C will continue to fire the atomizer, but will not be able to provide the desired wattage. The Weak Battery message will continue to display for a few seconds after the end of the puff.

Check Battery: The battery is deeply discharged and needs to be charged, or is damaged. If this happens, the DNA 80C will not fire the atomizer. The Check Battery message will continue to display for a few seconds after attempting to fire the device. User should remove and replace the battery.

Ohms Too High: The resistance of the atomizer coil is too high for the current wattage setting. If this happens, the DNA 80C will continue to fire, but will not be able to provide the desired wattage. The Ohms Too High message will continue to display for a few seconds after the end of puff.

Ohms Too Low: The resistance of the atomizer coil is too low for the current wattage setting. If this happens, the DNA 80C will continue to fire, but will not be able to provide the desired wattage. The Ohms Too Low message will continue to display for a few seconds after the end of puff.

Too Hot: The DNA 80C has onboard temperature sensing. It will shut down and display this message if the internal board temperature becomes excessive.

Auto power down

The screen will be at full brightness while firing. After 10 seconds with no button presses, the screen will turn off.

Charger

The DNA 80C has a built in 3A USB-C charger. It automatically detects the type of USB power supply it is connected to, so it can be plugged into standard PC USB ports or higher power USB-C chargers.

Battery monitoring

The DNA 80C contains a full battery management system that continuously monitors the state and health of the battery both under load and while idle.

Escribe

EScribe is a software package used to configure, monitor and modify the operation of your DNA 80C. It installs on a Windows PC and connects to your DNA 80C using the USB port. Escribe has a separate manual and tutorials which can be found on Evolv's site.

Wiring

The atomizer is connected to the OUT pad. If the DNA 80C is not being grounded through the mounting screws, the GND pad should connect to the negative side of the connector. The battery is connected to the B+ and B- terminals. It is important to use appropriately sized wire when using the DNA. Too small wire will not perform well, and significantly undersized wire can burn out. The output wires should be silicone or Teflon insulated only, and at least 14 gauge. The input wire carries less current, and can be as small as 20 gauge wire if silicone or Teflon insulated.

Recommended wire sizes

	Minimum size	Recommended size	Maximum size
Battery, silicone insulated	20 gauge	18 gauge	16 gauge
Battery, PVC Insulated	18 gauge	16 gauge	14 gauge
Output, silicone insulated	16 gauge	14 gauge	12 gauge
Switches, if used	28 gauge	24 gauge	22 gauge

Reverse Polarity Protection

The DNA 80C includes built in Reverse Polarity Protection to protect the user, board, device, and battery if a battery is inserted backwards.

External component recommendations

The DNA 80C is a self-contained power regulator which does not require external components for its user interface. However, it does support the use of external interface components if desired.

Fire button:

Use a momentary on, normally open type switch or button. A standard pushbutton switch is appropriate. The switch is a logic function – all power switching is handled with transistors inside the DNA module, so the switch does not need to be rated for power. A waterproof or processed sealed switch is recommended. Please use caution, as the positive side of the fire button connects directly to positive battery voltage.

Battery:

The DNA 80C runs from a single lithium polymer type battery pack or round lithium ion 21700/18650 type battery. The DNA 80C can use multiple cells in a parallel type wiring configuration as long as the maximum input voltage is 4.2v.

Mounting

The DNA 80C has onboard switches for adjusting the power level, navigating the interface and activating the output.

The DNA 80C has three mounting holes on the PCB. There is an extended mounting pad of .125” diameter around each. These holes are electrically connected to each other and to ground. With careful design, the mounting pads can be used to ground the chassis to the DNA 80C, and pass the output current through chassis to the connector. However, if using this method, ensure that the PCB remains in good contact with the board at all times. Split lock washers and a RoHS chromate conversion coating on the chassis are recommended.