



Building Guide: Jack Jr circuit-board

Board	Jack Jr / Pulsar / Water Heater
Version	Dec 2 nd , 2021

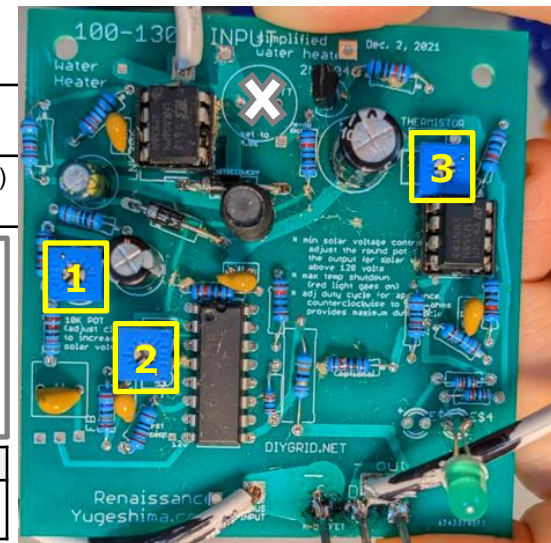
Board Design	Through-hole parts
Guide Version	OCT 29 th , 2022

Required materials:	①DC Power supply ②Soldering iron ③Multimeter
Optional	③A Alligator clips



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#	Task	Required tools	Required time	Instruction	Note	
1	Set up temp potentiometer	Multimeter	~5min	User multimeter to test pins 1&3 of potentiometer #3. Recommended value is 4.8kΩ	Easier to adjust potentiometer before soldering into the board. Conversion chart for customization: [4.4k = 105°C][4.8k = 73°C][5.2k = 65°C][5.6k= 57°C]	
2	Solder parts into board	Soldering iron	1-3hrs	Start soldering with resistors and smaller parts before moving into the larger parts	Time due to different factors such as correct tools and technique. Experience can be gained quite quickly.	
3	Functionality test	Power supply	~5min	Connect power supply and see the board turns on at 16V. Raising slowly to 100V	Pay attention when connecting to the power source clips to the plus and minus (input)	
4	Set up duty cycle	Power supply Screwdriver	~5min	Adjust according potentiometer #2 to your load requirements. Recommended value is 100%	This is used when to reduce the electricity drain on the input. Can also be used several circuits have the same power source,	
5	Set up minimum voltage	Adjustable power supply Screwdriver	~5min	Turn potentiometer #1 clockwise to increase the minimum shutoff voltage reference point. 93.7 is our recommended value to protect batteries.	Minimum voltage is set in order to: 1. Protect batteries from over-discharge 2. Set priorities between different circuits when sharing a power source: circuit board setup at lower voltage = higher priority	
6	Connect to box / heatsink	varies heavily depending requirements, available material. We recommend repurposing old aluminum power equipment (old inverters, DC-DC converters etc)				
7	Test under load	Batteries/Solar Appliance	~10min	We recommend keeping load below 1500Watts, taking into account a reliable heat sink.		
8	Test temperature protection	Multimeter Heat source	~10min	Confirm that the electricity output stops, red light blinks when over the temp. (box feels hot to touch) Soldering iron can also be used for testing with some accuracy.		



Boxing

- Indoor use only.
- Keep this device away from children and unauthorized users.

Required

Fuse



Heat sink or box



Wires, plugs, connectors



Optional

Meters



Power source Addon (diodes)



Disclaimer

Incorrect usage of the circuit may result in damage to the connected appliance; please refer to the [compatibility guide](#). A Shorted circuit will cause pure DC to flow through without the control functions, potentially damaging your appliance. Electricity is dangerous and can cause personal injury or DEATH as well as other property loss or damage if not used properly.