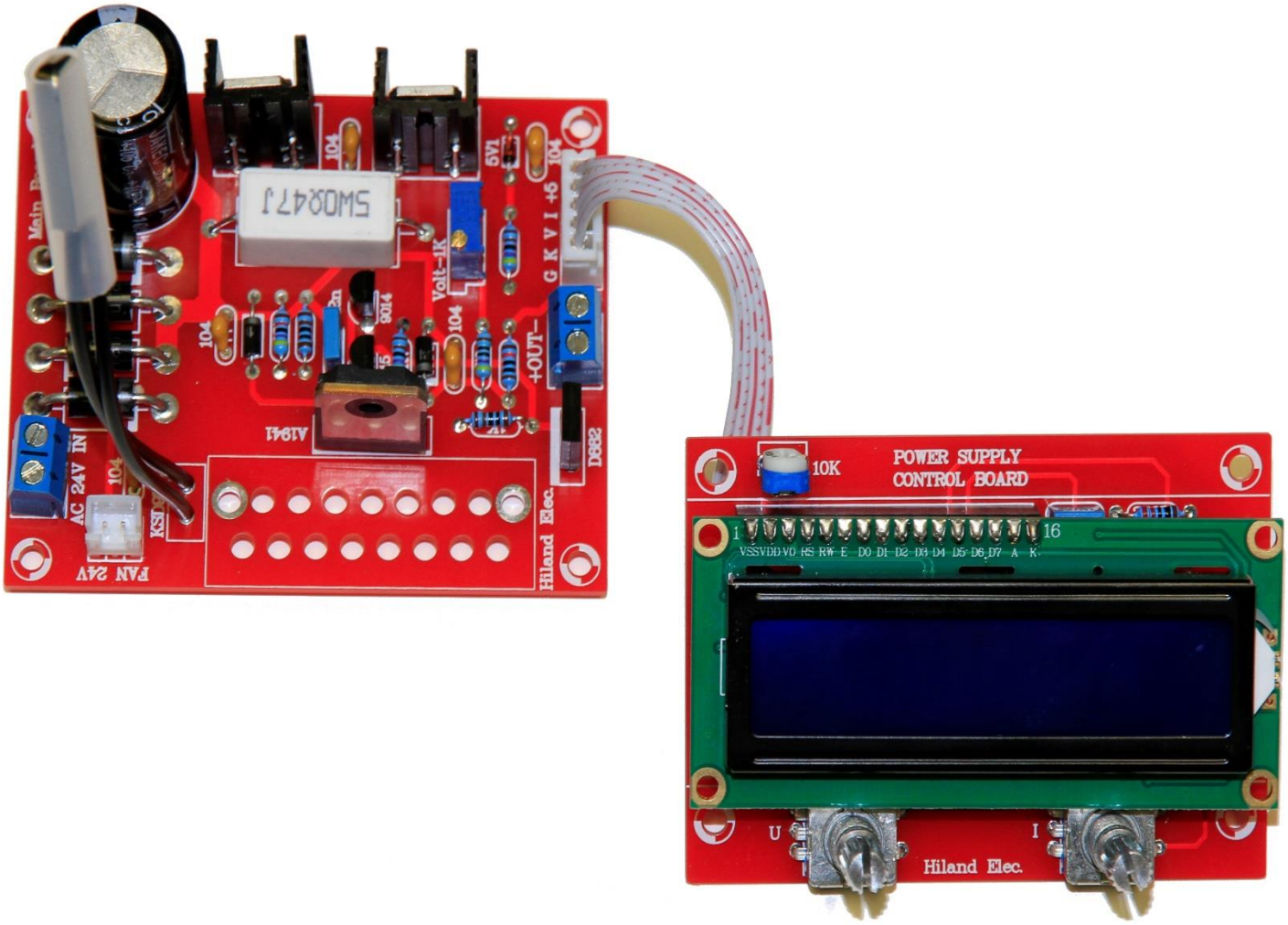
EN

# D.I.Y ADJUSTABLE DC REGULATED POWER SUPPLY

**Level: Intermediate** **AK-150**




ABRA Serving Industry & Education since 1990

## PARTS LIST

*Please make sure that the following pieces are included in your kit*

| Components | PCB Reference Number | Quantity |
|---|---|---|
| 20KΩ Resistor | 20K | 11 |
| 10KΩ Resistor | 10K | 11 |
| 220Ω Resistor | 220R | 1 |
| 470Ω Resistor | 470 | 4 |
| 5W Resistor | 0R47 | 1 |
| 1K Ω Resistor | 1K | 2 |
| 4.7K Ω Resistor | 4K7 | 2 |
| 47K Ω Resistor | 47K | 1 |
| Potentiometers | TB-271215 | 2 |
| 16Pin Headers | LCD1602 | 1 |
| 22nF Capacitor | 22n | 2 |
| 104µF Capacitor | 104 | 6 |
| IC Socket | ATMEGA8 | 1 |
| ATMEGA8 Micro Controller | ATMEGA8 | 1 |
| LCD Screen | LCD1602 | 1 |
| Trimmer Potentiometer E01 | 10K | 1 |
| 5Pin Socket | GKVI+5 | 2 |
| Extension Cable | N/A | 1 |
| Custom P.C.B | N/A | 2 |
| 3300 µF/ 50V Electrolytic Capacitor | 3300 µF/ 50V | 1 |
| IN4004 Diode | 4004 | 2 |
| 5V1 Zener Diode | 5V1 | 1 |
| 24V Fan Socket | FAN 24V | 1 |
| KSD9700 Temperature Switch | KSD9700 | 1 |
| Transistor 9015 | 9015 | 1 |
| Transistor 9014 | 9014 | 1 |
| Multi-Turn Potentiometer | Volt-1K | 1 |
| A1941 Transistor | A1941 | 1 |
| AC24V Terminal Block | AC24VIN | 1 |
| Output Terminal Block | +OUT- | 1 |
| D882 Transistor | D882 | 1 |
| 7805 Regulator | 7805 | 1 |
| 7824 Regulator | 7824 | 1 |
| Heat Sink | Next to 7824 and 7805 | 2 |

## REQUIRED TOOLS

| | | |
|---|---|---|
| **Soldering Iron** | **SI-9600** | **1** |
| **Solder 60 Tin / 40 Lead** | **4890-18G** | **1** |

## RELATED PRODUCTS

| | | |
|---|---|---|
| **24V 1A Transformer** | **TRF-155** | **1** |

## SOLDERING GUIDE

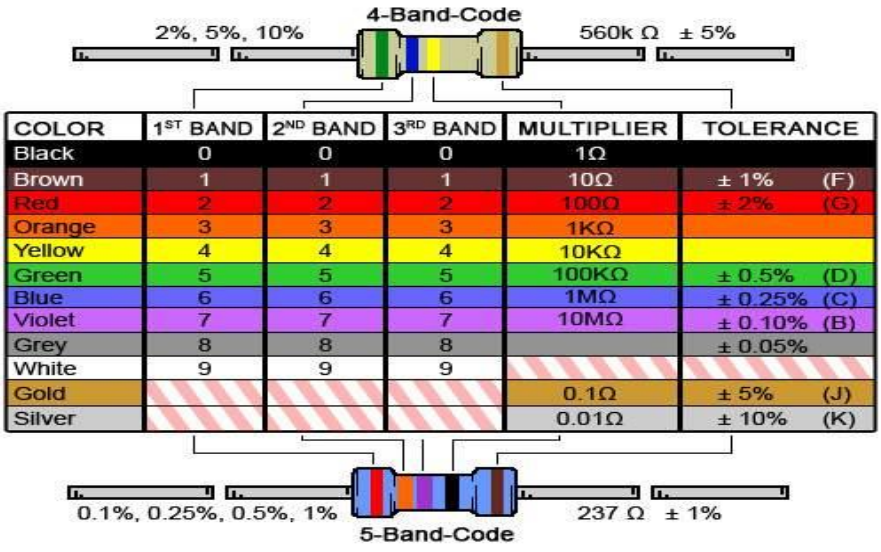
1. Turn on the soldering iron to 360ºC - 370ºC using Tin-Lead 60/40 solder.
2. Flip the board on the side where all the schematics are shown. Then, place the IC socket on the board where the white rectangle marked ATMEGA8 can be seen. Make sure the socket's notch faces the correct direction according to the schematic on the board. Then, place the IC on the socket and again, pay attention to the notch of the IC.
3. Insert the pins in the holes and begin the soldering process on the other side of the board.
4. After having soldered the IC socket, place all resistors found in the kit according to their matching schematics mentioned in the Parts List on the board (Refer to Appendix for a guide on reading resistor values).
   **Note:** Polarity is not an issue when placing the resistors on the board.
5. Insert the resistor leads in the holes, bend them in order to hold the resistors in the preferred position, flip the board and then, begin the soldering process for the resistors. Once finished, cut the remaining part of the resistors' leads.
6. Now, flip the board on the side with schematics and place the transistors and the potentiometers according to their schematics in the Parts List.
   **Note:** Pay attention to the schematics for these components to place them in the correct position.
7. Once again, insert the leads in the holes, flip the board, and begin soldering the leads.
8. Now, flip the board, place the regulators on the schematic named "7824" and "7805", insert the leads in the holes, flip the board again and begin soldering on the top side of the board. The remaining parts of the regulator should be cut after soldering; This should also be done for all other components.
9. To solder the capacitors, flip the board to its bottom side, place these capacitors on the schematics named according to what is mentioned in the Parts List for all capacitors and repeat the same instructions as in step 8 for these components.
   **Note:** Polarity is not an issue when placing the ceramic capacitors. But for the electrolytic capacitors, make sure that the negative lead is inserted into the hole placed on the shaded region.
10. Next up, solder the switching diodes and the Zener diodes where its marked "4004" and "5V1" respectively on the board. Repeat the same instructions as in step 8 afterwards.
11. Then, place the terminal blocks, the sockets, the heat sinks and the headers on the board on the matching schematics and begin the soldering process just like in step 8.

## WIRING GUIDE

1. First, you will need a transformer with a 24VAC output. Connect the red wires to the plug that you will insert into the outlet (use a heat shrink to cover exposed wires for safety) and the blue wires to the left and the right input pins of the AC24V terminal block.
   **Note:** The circuit must be connected to 24VAC power and not DC under any circumstances.
2. Then, insert the probes of the multimeter in the matching pins of the output terminal block of the board. Turn on the multimeter, adjust the voltage and amperage TB-271215 potentiometers to get the desired voltage and amperage (0V-28V DC Adjustable).
3. It is suggested that you use heat sinks and stick them on the regulator and the transistors to dissipate the heat that is generated. You are also provided with a 24V socket for the fan for the cooling purpose if you wish to use one.
4. Place the LCD screen with the male 16 Pin Headers soldered on it onto the female 16 Pin Headers which were previously soldered on the board. The LCD screen should face towards the inside of the board if placed correctly. Then, using the extension cable, connect the two GKVI+5 sockets on the separate boards to each other. You can then place this set up inside a custom case if you wish.
5. **Finally, please make sure that you have not made any mistakes in the connection of the transformer or in the soldering process of the components as the installation of a power supply involves high current and voltage and any errors could result in serious danger.**

## APPENDIX

***Resistor Table Values***




| COLOR | 1ST BAND | 2ND BAND | 3RD BAND | MULTIPLIER | TOLERANCE |
|---|---|---|---|---|---|
| Black | 0 | 0 | 0 | 1Ω | |
| Brown | 1 | 1 | 1 | 10Ω | ± 1% (F) |
| Red | 2 | 2 | 2 | 100Ω | ± 2% (G) |
| Orange | 3 | 3 | 3 | 1KΩ | |
| Yellow | 4 | 4 | 4 | 10KΩ | |
| Green | 5 | 5 | 5 | 100KΩ | ± 0.5% (D) |
| Blue | 6 | 6 | 6 | 1MΩ | ± 0.25% (C) |
| Violet | 7 | 7 | 7 | 10MΩ | ± 0.10% (B) |
| Grey | 8 | 8 | 8 | | ± 0.05% |
| White | 9 | 9 | 9 | | |
| Gold | | | | 0.1Ω | ± 5% (J) |
| Silver | | | | 0.01Ω | ± 10% (K) |

**You can download the manual from abra-electronics.com and search for AK-150.**
**Vous pouvez télécharger le Manuel sur abra-electronics.com en cherchant pour AK-150.**