ISolderStore Mini Tesla Coil Kit

ISolderStore DIY Mini Tesla Coil Kit Instruction Manual

Model: Mini Tesla Coil Kit

1. Introduction

This manual provides detailed instructions for the assembly, operation, and maintenance of your ISolderStore DIY Mini Tesla Coil Kit. This electronic kit is designed to allow users to build a functional Tesla coil capable of producing electric arcs, non-contact lighting, and playing music. It serves as an excellent soldering practice project and an educational tool for understanding basic electrical principles.

Image 1.1: Fully assembled ISolderStore Mini Tesla Coil Kit.

2. Safety Precautions

Please read and understand all safety warnings before assembling or operating the Tesla Coil Kit. Failure to follow these instructions may result in injury or damage to the product.

- **Soldering Safety:** This kit requires soldering. Ensure proper ventilation, use appropriate safety gear (e.g., safety glasses), and follow general soldering safety guidelines.
- **Tesla Wire Preparation:** It is crucial to burn or scrape off the insulating paint on both ends of the Tesla wire before soldering. Failure to do so will prevent the coil from functioning correctly.
- **Electrical Safety:** While this product is designed to be safe, it is not recommended to touch the electric arc directly at the top of the coil.
- **Heat Generation:** The heat sinks and the coil can become very hot during prolonged operation. If necessary, use a cooling fan to dissipate heat.
- **Electromagnetic Interference:** Keep mobile phones, MP3 players, and other electronic devices at least half a

meter away from the Tesla coil during operation to prevent high-frequency electromagnetic interference and potential damage to these devices.

- **Power Supply:** Use a DC power supply with an output of 15-24V and a current of 2A.

Image 2.1: Important precautions and common problem solutions.

3. What's in the Box

Your ISolderStore DIY Mini Tesla Coil Kit includes the following components:

- PCB Board
- 10K Resistors (2 pcs)
- 2K Resistors (2 pcs)
- Electrolytic Capacitor 1uF (1 pc)
- Monolithic Capacitor 105 (1 pc)
- 2P Pin Header (1 pc)
- 5mm Red LED (1 pc)

- 5mm Blue LED (1 pc)
- 80NF70 Transistor (1 pc)
- BD243 Transistor (1 pc)
- DC Power Socket (1 pc)
- 3.5mm Audio Socket (1 pc)
- Audio Cable (1 pc)
- Tesla Coil (1 pc)
- Heat Sinks (2 pcs)
- Screws (6 pcs)
- Copper Pillars (4 pcs)
- Neon Bulb (1 pc)
- Double-sided Tape (1 pc)
- Black Wire (1 pc)

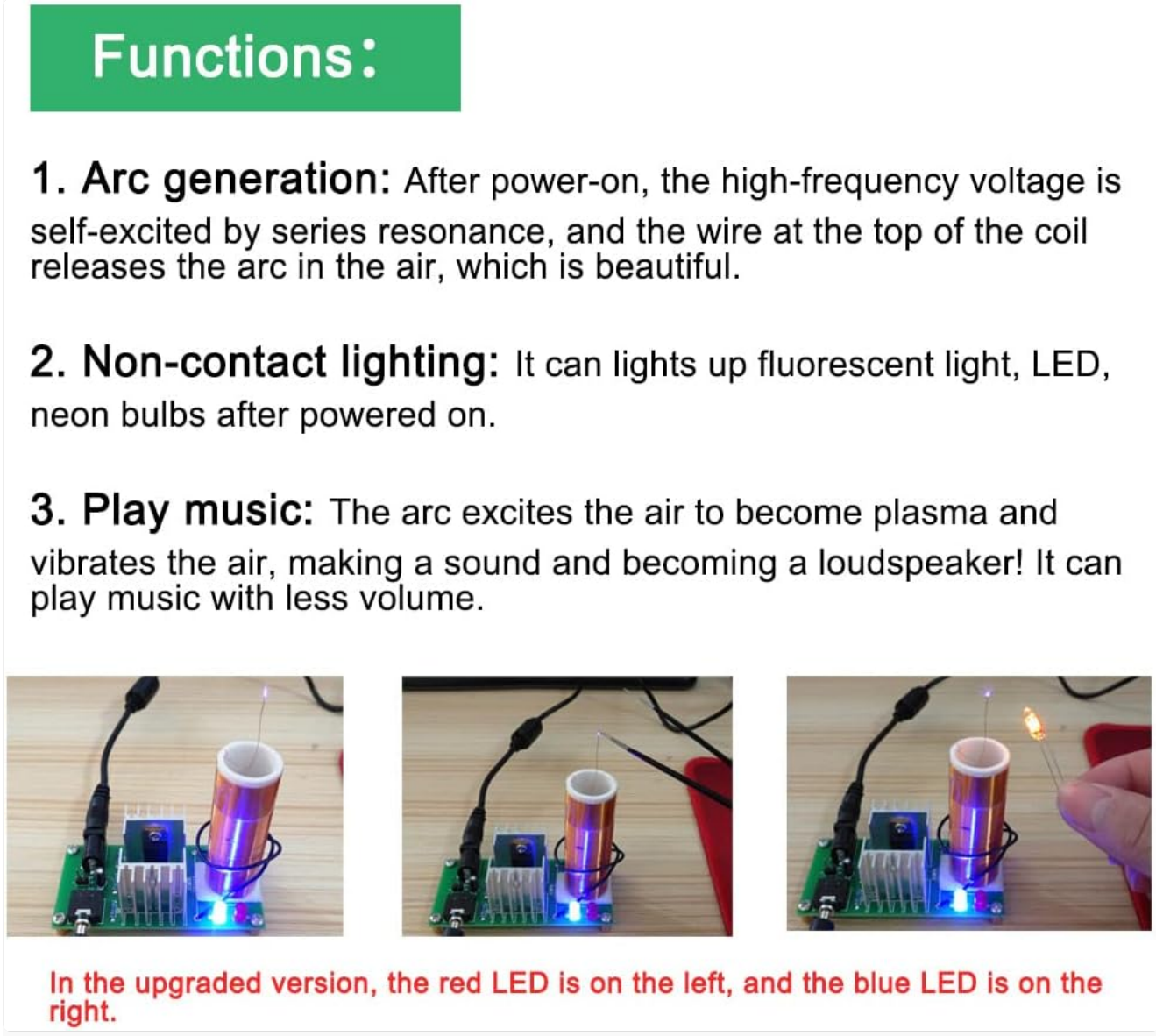

Image 3.1: All components included in the kit.

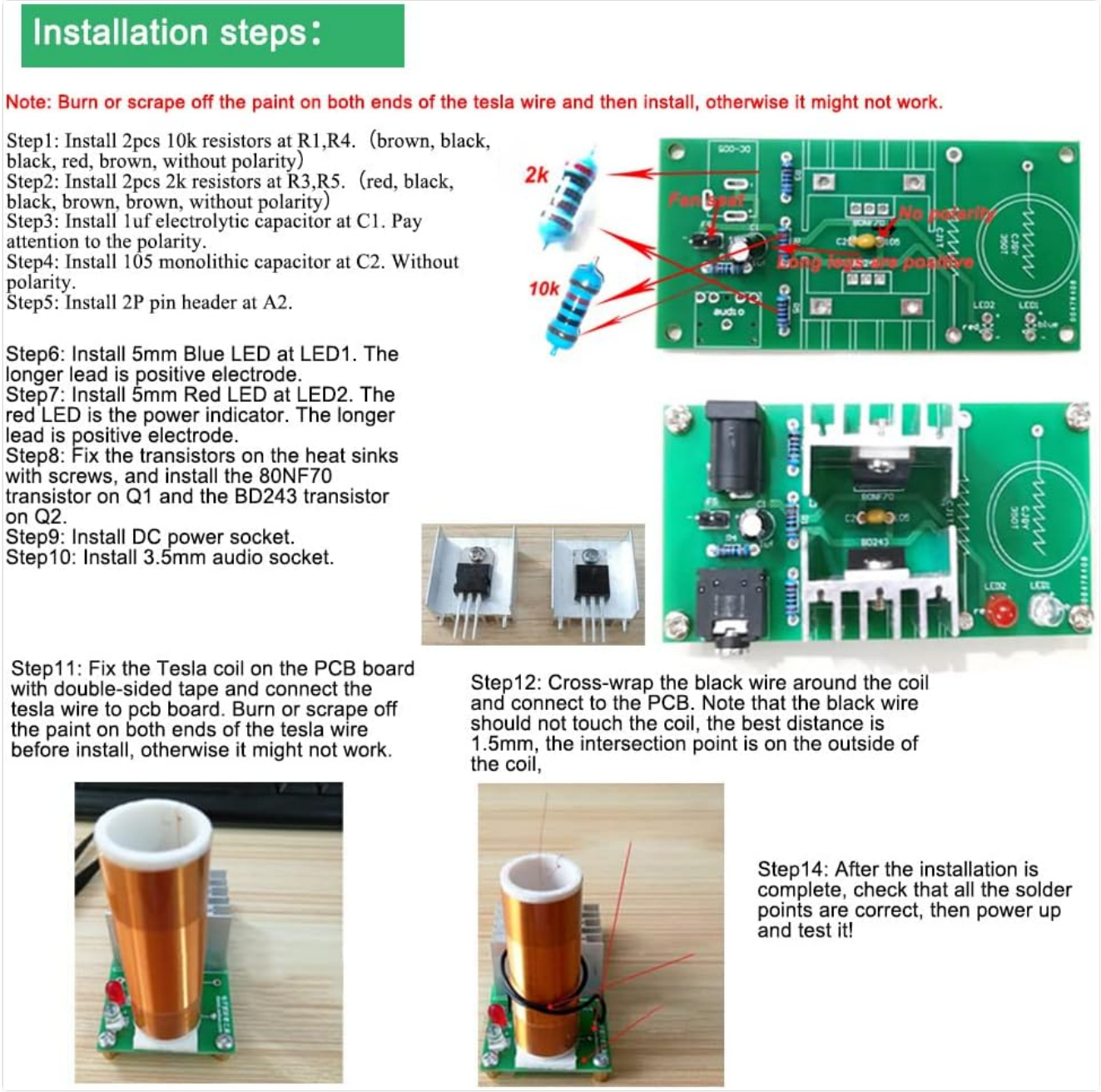

Image 3.2: Detailed packing list and assembly tips.

4. Setup and Assembly

This kit requires soldering. Please ensure you have the necessary tools (soldering iron, solder, wire cutters, etc.) and follow the steps carefully. For detailed visual instructions, scan the QR code provided with your package.

1. **Install Resistors:** Solder the two 10K resistors at positions R1 and R4 (brown, black, black, red, brown, without polarity). Solder the two 2K resistors at R3 and R5 (red, black, black, brown, brown, without polarity).
2. **Install Capacitors:** Solder the 1uF electrolytic capacitor at C1, paying attention to its polarity. Solder the 105 monolithic capacitor at C2, which has no polarity.
3. **Install 2P Pin Header:** Solder the 2P pin header at A2.
4. **Install LEDs:** Solder the 5mm Blue LED at LED1. The longer lead is the positive electrode. Solder the 5mm Red LED at LED2. The longer lead is the positive electrode. The red LED indicates power, and the blue LED indicates arc generation.
5. **Install Transistors:** Fix the transistors onto the heat sinks with screws. Install the 80NF70 transistor at Q1 and the BD243 transistor at Q2.

6. **Install Sockets:** Solder the DC power socket and the 3.5mm audio socket.
7. **Mount Tesla Coil:** Fix the Tesla coil onto the PCB board using double-sided tape.
8. **Connect Black Wire:** Cross-wrap the black wire around the coil and connect it to the PCB. Ensure the black wire does not touch the coil, maintaining a distance of approximately 1.5mm. The intersection point should be on the outside of the coil.
9. **Prepare Tesla Wire:** Before installation, burn or scrape off the paint on both ends of the Tesla wire. This is critical for proper operation.
10. **Final Check:** After completing all soldering, carefully check all solder points for proper connections and ensure no short circuits.

Image 4.1: Visual guide for component placement and soldering.

Image 4.2: PCB dimensions and recommended power supply information.

5. Operating Instructions

Once assembled and verified, your Mini Tesla Coil Kit is ready for operation. Ensure a 15-24V DC, 2A power supply is connected.

5.1 Arc Generation

Upon power-on, the high-frequency voltage is self-excited by series resonance. The wire at the top of the coil will release a visible electric arc into the air. The higher the input voltage (within the 15-24V range), the more pronounced the arc effect will be.

5.2 Non-Contact Lighting

The Tesla coil can wirelessly light up fluorescent lights, LEDs, and neon bulbs. Simply bring a compatible bulb close to the top of the coil after it is powered on. The electromagnetic field will induce current in the bulb, causing it to light up without direct contact.

5.3 Music Playback

Connect an audio source (e.g., smartphone, MP3 player) to the 3.5mm audio input jack on the Tesla coil. The arc will excite the air, creating plasma that vibrates the air, effectively turning the arc into a plasma speaker. Music will be played through the arc, though at a lower volume compared to conventional speakers.

Packing List:

Component name	Qty	Marker	Component name	Qty	Marker
10K Resistor	2	R1,R4	2K Resistor	2	R3,R5
Electrolytic capacitor 1uf	1	C1	Tesla coil	1	
Monolithic capacitor105	1	C2	3.5mm audio socket	1	
2P Pin header	1	A2	Audio cable	1	
5mm RED LED	1	LED2	Heat sink	2	
5mm Blue LED	1	LED1	Screw	6	
80NF70 transistor	1	Q1	Copper pillar	4	
BD243 transistor	1	Q2	Neon bulb	1	
DC power socket	1		Double-sided tape	1	
Black wire	1		PCB board	1	

If the tesla coil kit you purchased is a imitation, please apply for 10 times compensation.

Tips:

Please check the components before soldering, if there are any components lost, please feel free to contact us.

Please scan the QR code on the product to get the detail installation instruction manual.

Most of our customers can successfully assemble this Tesla module.

Image 5.1: Demonstrations of arc generation and non-contact lighting with a neon bulb.

Image 5.2: The Tesla coil in action, demonstrating its capabilities.

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Video 5.3: Official demonstration of the Tesla Coil Kit's functions, including arc generation and non-contact lighting.

6. Maintenance

The ISolderStore Mini Tesla Coil Kit is designed for durability, but proper care ensures longevity and optimal performance:

- **Cleaning:** Keep the PCB and components free from dust and debris. Use a soft, dry cloth for cleaning.
- **Component Inspection:** Periodically check soldered connections for any signs of loosening or corrosion. Re-solder if necessary.
- **Wire Integrity:** The coil wire is delicate (approximately 0.0055" diameter). Handle with care to avoid breakage.
- **Heat Management:** If operating for extended periods, consider adding a small fan to cool the heat sinks and prevent overheating.
- **Storage:** Store the assembled kit in a dry, cool environment away from direct sunlight and excessive humidity.

7. Troubleshooting

If your Tesla Coil Kit does not function as expected after assembly, refer to the following common issues and solutions:

- **No Arc/Functionality:**
  - **Tesla Wire Paint:** Ensure the insulating paint on both ends of the Tesla wire has been completely burned or scraped off before soldering.
  - **Short Circuit:** Check all solder points for any unintended connections or short circuits.
  - **Power Supply:** Verify that the power supply is 15-24V DC and provides at least 2A of current.
  - **Audio Connection:** If attempting music playback, ensure the audio cable is securely plugged into the 3.5mm audio socket.
- **Red Light Off (No Power Indication):**
  - Check the polarity of the electrolytic capacitor and LEDs.
  - Verify the correct installation of resistors (10K and 2K) according to the markings on the board.
- **Blue Light On, But No Arc:**
  - Ensure the black wire's intersection point is on the outside of the coil and maintains a 1.5mm distance from the coil.
  - Confirm the 80NF70 and BD243 transistors are correctly installed.
- **Weak Arc/Lighting:**
  - Increase the input voltage towards the upper limit of 24V (ensure power supply can handle it).
  - Check for any loose connections or cold solder joints.

If you encounter persistent issues, please contact ISolderStore customer support for professional assistance.

8. Specifications

Feature	Specification
Product Dimensions	7.4 x 4.33 x 0.78 inches
Item Weight	2.39 ounces
Input Voltage	DC 15-24V
Input Current	2A (recommended)
Manufacturer	ISolderStore
Recommended Age	12 years and up

9. Warranty and Support

ISolderStore is committed to customer satisfaction. If any components are missing from your kit, please contact us immediately for replacements. For any questions regarding assembly, operation, or troubleshooting that are not covered in this manual, please reach out to our customer support team for professional assistance.
You can find contact information by scanning the QR code provided on the product packaging or by visiting the

ISolderStore storefront on Amazon.

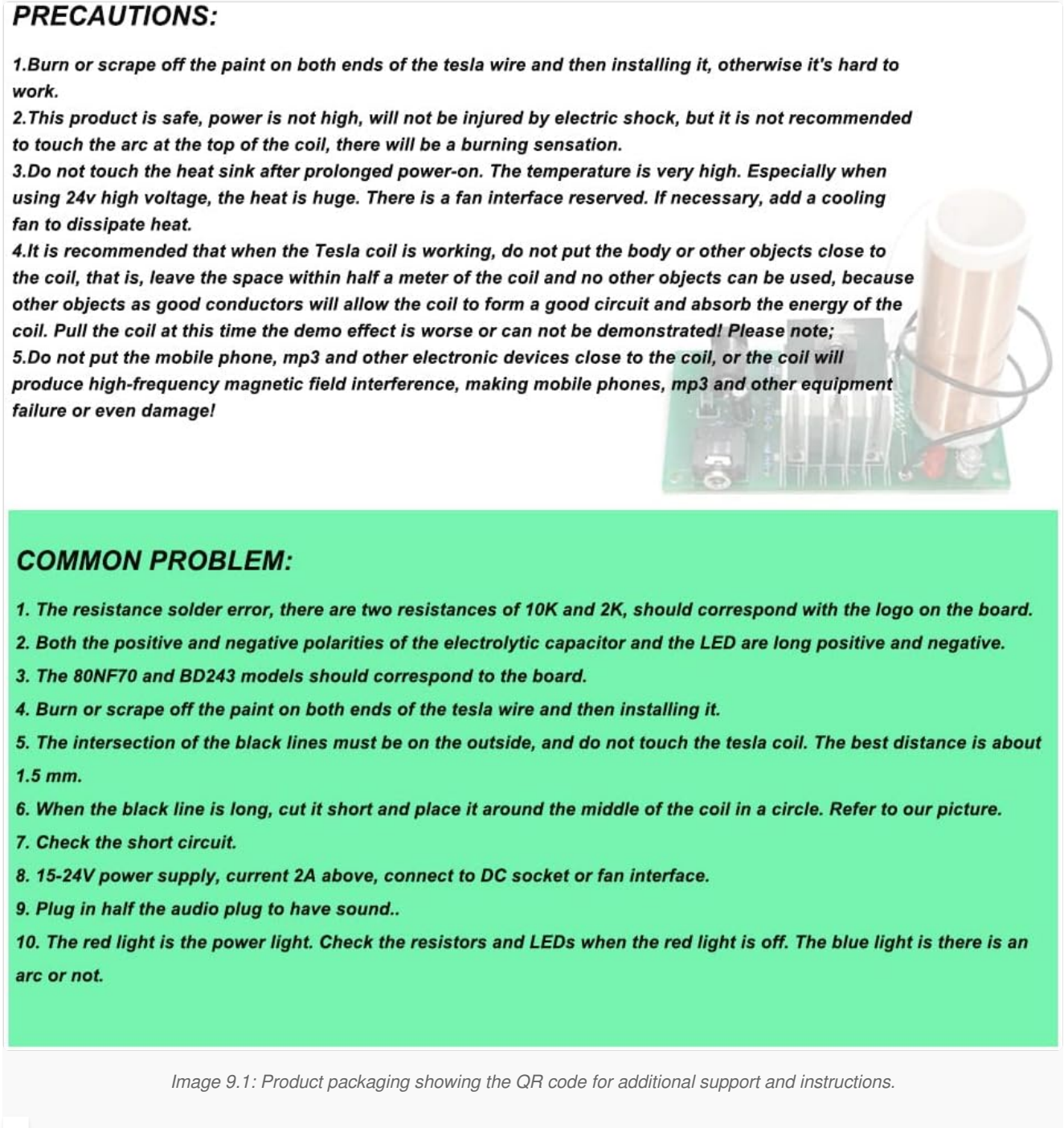

Image 9.1: Product packaging showing the QR code for additional support and instructions.