User Manual for 220V to 12V/24V LED Strip Transformer

1. Product Introduction

This product is a dedicated transformer for LED light strips with AC 220V input and DC 12V/24V dual-specification output (hereinafter referred to as "transformer"). Designed specifically for low-voltage LED light strips (flexible light strips, hard light bars, etc.), its core function is to stably convert the conventional 220V AC mains power used in homes and commercial premises into safe DC 12V or 24V voltage, providing stable and safe power supply for low-voltage LED light strips. It is also equipped with multiple safety protections such as overload protection, short-circuit protection, and overheating protection, suitable for the installation and use of low-voltage LED light strips in various scenarios.
Core Compatibility: Only applicable to DC LED light strips with a rated voltage of 12V or 24V. It is strictly prohibited to directly connect to 220V AC light strips; it is also strictly prohibited to connect the output terminal of the transformer to 220V mains power, so as to avoid equipment damage, short circuit, or even fire and other serious safety hazards.

2. Safety Warnings (Must Read!)

Before operation, ensure that **all power supplies are completely disconnected** (unplug the transformer input plug or turn off the corresponding socket switch or air switch). It is strictly prohibited to wire, plug, unplug or debug with power on to prevent electric shock accidents.

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Before use, check that the output voltage (12V/24V) of the transformer is completely consistent with the rated voltage of the light strip, and the output current (power) is not lower than the total power of the light strip. Mismatched voltage/power will directly burn out the light strip or the transformer.

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It is strictly prohibited to disassemble or modify the transformer shell and internal components. If the shell is damaged, the circuit is exposed, or there is a burning smell or abnormal noise, immediately stop using it, cut off the power supply, and contact after-sales service for maintenance. Do not repair it yourself.

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The installation and use environment must be dry, ventilated and cool. Keep away from water, humid areas (such as bathroom shower areas, water accumulation areas) and high-temperature, flammable and explosive items (such as stoves, alcohol, cartons) to prevent short circuit, electric leakage or fire.

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Children are not allowed to touch the transformer, terminal blocks or the light strip when it is powered on to avoid electric shock or scald. All installation and operation must be completed by adults.

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It is strictly prohibited to use it beyond the rated load: the rated power of the transformer must be ⩾ the total power of the connected light strip (total power of the light strip = power per meter × total length). Long-term overload use will cause the transformer to overheat and age, triggering protection functions or causing safety hazards.

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During use, if you find that the transformer is abnormally hot, the shell is scalding, sparks or peculiar smell appear, or the light strip flickers or does not light up, immediately unplug the input plug, cut off the power supply, and check the fault before using it again.

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When not in use for a long time, be sure to unplug the input plug of the transformer to avoid standby power consumption and accidental hazards. Regularly check whether the terminal blocks are loose and the lines are damaged, and fasten or replace them in time.

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When wiring, distinguish the positive and negative poles (the output terminal of the transformer is marked with "+" for positive pole and "-" for negative pole; the light strip interface is also marked with positive and negative poles clearly). Reversing the positive and negative poles will cause the light strip to not light up, and some light strips may be damaged due to reverse connection.

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3. Product Parameters

Parameter Name	Specification Parameters	Detailed Description
Input Voltage	AC 220V ±10% 50Hz	Suitable for conventional mains power in homes and commercial premises. It is strictly prohibited to connect to non-standard voltage power supplies.
Output Voltage	DC 12V / 24V Dual Specifications	According to the rated voltage of the light strip, select the corresponding gear through the toggle switch (for some models) or the corresponding output terminal. It must be consistent with the voltage of the light strip.
Rated Output Current	Different according to models (common 3A, 5A, 8A, 10A)	Rated Power = Output Voltage × Rated Current (Example: 12V/5A = 60W, 24V/5A = 120W)
Rated Power	Different according to models (common 36W, 60W, 120W, 240W)	It must be greater than or equal to the total power of the connected light strip. It is recommended to reserve 10%-20% power margin.

Parameter Name	Specification Parameters	Detailed Description
Protection Level	Common IP20 (Indoor Dry), IP44 (Splash-Proof), IP65 (Waterproof)	IP20 is only suitable for indoor dry environments; IP44 is splash-proof but not rain-proof; IP65 can be short-term rain-proof outdoors.
Protection Functions	Overload Protection, Short-Circuit Protection, Overheating Protection	When protection is triggered, the transformer stops output. After troubleshooting (reducing load, connecting lines properly), cut off the power supply and restart to resume normal operation.
Operating Temperature	-10℃~45℃	Avoid long-term use in high-temperature and closed environments, which will affect heat dissipation.
Output Ripple	≤120mVp-p	Low ripple ensures stable lighting of the light strip without flicker.

4. Wiring and Usage Steps

Step 1: Preparation (Safety Premise)

1. Ensure all power supplies are disconnected: Unplug the transformer input plug, turn off the corresponding socket switch or air switch at home to avoid live operation;
2. Verify parameter consistency: Recheck the rated voltage (12V or 24V) and total power of the light strip, which must match the output voltage and rated power of the transformer, with a 10%-20% power margin reserved (Example: A 60W transformer is recommended to connect to a light strip ≤50W);
3. Check equipment integrity: Check that the transformer shell is not damaged, the lines are not exposed, and the input and output terminals are not loose or rusty; Check that the light strip cut is flat, the copper core is not exposed or damaged, and the positive and negative pole marks are clear;
4. Prepare tools: Wire stripper, screwdriver (for screw-fixed terminals), insulating tape (optional, for strengthening insulation).

Step 2: Voltage Selection (Only for Dual-Voltage Adjustable Models)

If the transformer is equipped with a 12V/24V toggle switch (usually located on the side or back of the shell), toggle the switch to the corresponding gear according to the rated voltage of the light strip (12V gear for 12V light strips, 24V gear for 24V light strips);
If the transformer has fixed dual output terminals (marked 12V+, 12V- and 24V+, 24V- respectively), directly select the terminal corresponding to the light strip voltage for wiring. Do not connect to the wrong gear or terminal.

Step 3: Wiring Operation (Input Terminal → Output Terminal, Order Cannot Be Changed)

3.1 Input Terminal Wiring (220V Mains Connection)

The input terminal of the transformer is usually marked with "AC IN", "L", "N" for connecting 220V mains power. Two common wiring methods:
Method 1: Plug-in Input (with built-in 220V plug) — No wiring is required. When powering on later, directly insert it into a standard 220V AC socket (this step can be skipped and proceed directly to output terminal wiring);
Method 2: Terminal Input (without built-in plug) — Use a wire stripper to strip the outer skin of both ends of the mains wire, exposing 1-2cm of copper core, and arrange it neatly without branching:

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Connect the live wire (usually red, brown) to the terminal marked "L", and the neutral wire (usually blue, black) to the terminal marked "N";

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Tighten the terminal fixing screw with a screwdriver to ensure the copper core is firmly fixed (do not tighten too hard to break the copper core, nor too loose to cause poor contact);

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Check the wiring point. If there is exposed copper core, rearrange it. Insulating tape can be wrapped to strengthen insulation.

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3.2 Output Terminal Wiring (Connect to Low-Voltage Light Strip, Focus on Distinguishing Positive and Negative Poles)

The output terminal of the transformer is usually marked with "DC OUT", "+" (positive pole), "-" (negative pole), which are connected to the positive and negative poles of the light strip respectively. Two common wiring methods:
Method 1: Tool-Free Press-Type Terminals

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Strip the outer skin of both ends of the light strip, exposing 1-2cm of copper core (do not strip too much to avoid short circuit);

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Press the press button on the transformer output terminal, insert the copper core of the light strip positive pole (marked "+") into the "+" terminal hole, and the copper core of the light strip negative pole (marked "-") into the "-" terminal hole;

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Release the press button, gently pull the light strip to confirm that the copper core is firmly fixed without loosening; Cover the terminal protection cover (if any).

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Method 2: Screw-Fixed Terminals

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Strip the outer skin of both ends of the light strip, exposing 1-2cm of copper core, and arrange it neatly without branching;

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Loosen the fixing screws corresponding to the "+" and "-" of the output terminal with a screwdriver;

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Insert the copper core of the light strip positive pole into the "+" terminal slot, and the copper core of the negative pole into the "-" terminal slot, then tighten the fixing screws;

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Check that there is no exposed copper core at the wiring point and the positive and negative poles are not reversed. If necessary, wrap insulating tape to strengthen.

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Step 4: Power-On Test and Fixation

1. Comprehensive Inspection: Recheck the voltage gear/terminal, positive and negative wiring, whether all screws are tight, no exposed copper core and no damaged lines;
2. Power-On Test: Insert the transformer input plug into a 220V socket (for terminal input, connect the plug first and then insert it), and turn on the power switch; Observe whether the light strip lights up normally without flicker or peculiar smell;
3. Troubleshooting: If the light strip does not light up, immediately cut off the power supply, check whether the positive and negative poles are reversed, the wiring is loose, or the voltage gear is correct; If flicker, excessive heating of the transformer or peculiar smell occurs, immediately cut off the power supply and check whether it is overloaded or the line is short-circuited;
4. Fixed Installation: After the light strip lights up normally, fix the transformer in a dry, ventilated and inaccessible position (can be fixed with screws or bundled with cable ties), avoid squeezing or pulling the wiring point; Fix the light strip according to the installation requirements, and keep the wiring point away from humid and high-temperature areas.

5. Common Faults and Solutions

Common Faults	Possible Causes	Solutions
The light strip does not light up at all	1. Reversed positive and negative poles; 2. Loose wiring and poor copper core contact; 3. Wrong voltage gear/terminal selection; 4. Power supply not connected; 5. Transformer triggered protection or malfunction; 6. Damaged light strip	1. Cut off the power supply and exchange the positive and negative wiring of the light strip; 2. Re-fasten the wiring to ensure good contact of the copper core; 3. Check the light strip voltage and adjust the gear or terminal; 4. Check the power socket and switch to ensure power supply; 5. Cut off the power supply and restart the transformer, check if it is overloaded, and contact after-sales service if it still malfunctions; 6. Replace the damaged light strip
The light strip flickers and the brightness is unstable	1. Poor wiring contact; 2. Transformer overload; 3. Unstable power supply voltage; 4. The light strip is too long, resulting in terminal voltage attenuation; 5. Transformer malfunction	1. Cut off the power supply and fasten the wiring; 2. Reduce the length of the light strip or replace it with a high-power transformer; 3. Replace the power socket for testing to check the stability of the mains power; 4. Add power supply points (add one transformer every 5-10 meters, adjust according to the light strip model); 5. Contact after-sales service to repair the transformer
The transformer is abnormally hot and scalding	1. Long-term overload use; 2. Poor ventilation and high ambient temperature; 3. Poor wiring contact and high contact resistance; 4. Internal malfunction of the transformer	1. Immediately cut off the power supply, reduce the light strip load or replace it with a high-power transformer; 2. Move the transformer to a ventilated and cool place to avoid closed extrusion; 3. Re-fasten the wiring and check the contact problem; 4. Contact

Common Faults	Possible Causes	Solutions
		after-sales service to repair or replace the transformer
The transformer has peculiar smell and sparks	1. Severe overload; 2. Wiring short circuit (exposed copper core contact); 3. Transformer water intake and moisture; 4. Transformer aging and internal malfunction	Immediately cut off the power supply and stop using it; Check the short circuit problem and replace the transformer; If it is wet, it needs to be completely dried before testing, and replaced if it cannot be used; It is strictly prohibited to continue using the faulty transformer
The transformer triggers protection (stops output)	1. Overload use; 2. Line short circuit; 3. Transformer overheating; 4. Abnormal input voltage	Cut off the power supply and troubleshoot: reduce the load, repair the short-circuit line, and improve ventilation and heat dissipation; After the transformer cools down, cut off the power supply and restart to resume normal operation; If it is triggered frequently, check the parameter matching or contact after-sales service

6. Daily Maintenance

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Regular Inspection: Check once a week whether the wiring points are loose and the lines are damaged; Check once a month whether the transformer shell and terminals are rusty or aging, and fasten or replace damaged parts in time.

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Cleaning and Maintenance: Keep the surface of the transformer clean, avoid dust, oil stains and water stains attached. It can be gently

wiped with a dry soft cloth. It is strictly prohibited to wash or spray the transformer with water to avoid moisture.

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Environment Maintenance: Ensure that the transformer installation environment is dry, ventilated and cool. Avoid long-term use in high-temperature, closed and humid environments. Keep away from flammable, explosive items and sharp objects to prevent shell damage.

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Idle Handling: When not in use for a long time, be sure to unplug the input plug. Store the transformer and light strip properly in a dry and ventilated place to avoid extrusion and collision, and prevent line aging.

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Outdoor Maintenance: For waterproof transformers used outdoors (IP65 and above), regularly check the tightness of the protective cover and wiring points to avoid water intake; Try to avoid being exposed to rain outdoors on rainy days to extend the service life.

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Fault Handling: When the transformer malfunctions, it is strictly prohibited to disassemble and repair it yourself. Contact the manufacturer's after-sales service or professional electrician for handling to avoid expanding the fault or causing safety hazards.

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7. Supplementary Notes

1. When wiring, do not confuse or reverse the input terminal (220V) and output terminal (12V/24V). It is strictly prohibited to connect the output terminal to the mains power, otherwise the transformer and light strip will be directly burned out.

2. When multiple low-voltage light strips are used in parallel, the total power shall not exceed the rated power of the transformer; When used in series, calculate the total voltage of the light strip to ensure it matches the output voltage of the transformer (it is not recommended to connect multiple light strips in series, which may easily lead to uneven brightness).
3. When the length of the light strip exceeds the range specified by the manufacturer (usually a single 12V light strip does not exceed 5 meters, and a single 24V light strip does not exceed 10 meters), power supply points must be added to avoid terminal brightness attenuation and prevent transformer overload.
4. It is recommended to wrap insulating tape at the wiring point to strengthen insulation, especially in outdoor, humid environments or locations accessible to children, so as to improve insulation performance and prevent electric leakage.
5. The transformer is a consumable with a normal service life of about 2-5 years. If aging, frequent protection triggering, unstable output and other conditions occur, it should be replaced in time to avoid safety hazards.
6. After the product is scrapped, do not discard it at will. It should be put into recyclables or hazardous waste collection points (including electrical components) according to local garbage classification requirements to protect the environment.
7. If it is necessary to extend the wiring, the input terminal (220V) should use wires that meet national standards, and the output terminal (12V/24V) should select the appropriate wire diameter according to the current size to avoid overheating caused by too thin wire diameter.