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› AFITSEP TPR-3020D DC Power Supply User Manual

## AFITSEP TPR-3020D

# AFITSEP TPR-3020D DC Power Supply User Manual

Model: TPR-3020D

## 1. INTRODUCTION

This manual provides essential information for the safe and efficient operation of the AFITSEP TPR-3020D DC Power Supply. Please read this manual thoroughly before using the device and retain it for future reference. The TPR-3020D is a high-precision, stable, and programmable DC regulated power supply designed for various laboratory, industrial, and educational applications.

## 2. SAFETY INSTRUCTIONS

**WARNING: Failure to follow these safety instructions may result in electric shock, fire, or personal injury.**

- Ensure the power supply is connected to a properly grounded AC outlet.
- Do not operate the device in wet or damp conditions.
- Do not open the casing of the power supply. There are no user-serviceable parts inside. Refer all servicing to qualified personnel.
- Verify the input voltage matches the power supply's rating before connecting to the mains.
- Avoid short-circuiting the output terminals.
- Always disconnect the power supply from the mains before making or breaking connections to the output terminals.
- Use appropriate current-rated wires for connections.
- Keep the ventilation openings clear to prevent overheating.

## 3. PRODUCT OVERVIEW

The AFITSEP TPR-3020D is a linear DC power supply offering precise control over voltage and current. It features multiple protection functions to ensure safe operation.

### 3.1 Key Features

- High precision and stability: Output voltage and current are precisely adjustable.
- Programmable control: Supports various programming interfaces for remote automated operation.
- Wide range output: Covers a variety of voltage and current ranges (30V, 20A).
- Multi-protection: Includes over-current, over-voltage, and other protection functions.

## 3.2 Front Panel Layout

The front panel provides all necessary controls and indicators for operation.



Figure 1: Front Panel of the TPR-3020D DC Power Supply. This image shows the main display, voltage and current adjustment knobs, output terminals, and power switch.

1. **Voltage Display:** Shows the current output voltage.
2. **Current Display:** Shows the current output current.
3. **Voltage Adjustment Knob:** Coarse and fine adjustment for output voltage.
4. **Current Adjustment Knob:** Coarse and fine adjustment for output current limit.

5. **Output Terminals:** Positive (+), Negative (-), and Ground (GND) terminals.
6. **Power Switch:** Turns the unit ON/OFF.

### 3.3 Rear Panel Layout

The rear panel contains the AC power input and ventilation.



Figure 2: Rear Panel of the TPR-3020D DC Power Supply. This image illustrates the AC power input socket, fuse holder, and cooling fan vents.

1. **AC Power Input:** Connects to the mains power cable.
2. **Fuse Holder:** Contains the protective fuse.
3. **Cooling Fan:** Provides necessary ventilation.

## 4. SETUP

Follow these steps to set up your AFITSEP TPR-3020D DC Power Supply.

1. **Unpacking:** Carefully remove the power supply from its packaging. Inspect for any signs of damage during transit. Report any damage to your supplier immediately.
2. **Placement:** Place the power supply on a stable, level surface. Ensure adequate ventilation around the unit, keeping at least 10 cm (4 inches) clear space on all sides, especially around the rear fan.
3. **Power Connection:**
  - Ensure the power switch on the front panel is in the OFF position.
  - Connect the provided AC power cord to the AC power input socket on the rear panel.
  - Plug the other end of the AC power cord into a grounded mains outlet.
4. **Output Connections:**
  - Before connecting any load, ensure the power supply is OFF.
  - Connect the positive (+) terminal of your load to the red (+) output terminal of the power supply.
  - Connect the negative (-) terminal of your load to the black (-) output terminal of the power supply.
  - If grounding is required for your application, connect the ground terminal of your load to the green (GND) output terminal.
  - Ensure all connections are secure and properly insulated.

## 5. OPERATING INSTRUCTIONS

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This section details the basic operation of the TPR-3020D DC Power Supply.

### 5.1 Basic Operation

1. **Power On:** After making all connections, turn the power switch to the ON position. The displays will illuminate.
2. **Setting Voltage:**
  - Adjust the **Voltage Adjustment Knob** (coarse) to set the approximate desired voltage.
  - Use the **Voltage Adjustment Knob** (fine) for precise voltage adjustment.
  - Observe the Voltage Display to confirm the setting.
3. **Setting Current Limit:**
  - *Important:* It is recommended to set the current limit before connecting a sensitive load.
  - To set the current limit without a load, short-circuit the output terminals (briefly connect + to - with a suitable wire). The current display will show the maximum current.
  - Adjust the **Current Adjustment Knob** (coarse) to set the approximate desired current limit.
  - Use the **Current Adjustment Knob** (fine) for precise current limit adjustment.
  - Remove the short circuit. The current display will now show zero (or a very small leakage current).
4. **Connecting Load:** Connect your load to the output terminals as described in the Setup section. The power supply will now deliver the set voltage and current (up to the set limit).
5. **Power Off:** Before disconnecting the load, turn the power switch to the OFF position.

### 5.2 Constant Voltage (CV) and Constant Current (CC) Modes

The TPR-3020D automatically switches between Constant Voltage (CV) and Constant Current (CC) modes depending on the load conditions.

- **Constant Voltage (CV) Mode:** When the load resistance is high, the output current is less than the set current limit. The power supply maintains the set output voltage.

- **Constant Current (CC) Mode:** When the load resistance is low, the output current reaches the set current limit. The power supply maintains the set output current, and the output voltage drops accordingly.

## 6. MAINTENANCE

Proper maintenance ensures the longevity and reliable operation of your power supply.

- **Cleaning:** Disconnect the power supply from the mains before cleaning. Use a soft, dry cloth to wipe the exterior. Do not use abrasive cleaners or solvents.
- **Ventilation:** Regularly check that the ventilation openings on the rear panel are free from dust and obstructions. Use compressed air to clear dust if necessary.
- **Fuse Replacement:** If the power supply does not turn on, the fuse may need replacement.
  - Disconnect the power supply from the mains.
  - Locate the fuse holder on the rear panel.
  - Carefully remove the fuse holder and replace the fuse with one of the same type and rating (e.g., 250V/5A).
  - Reinsert the fuse holder securely.
- **Storage:** When not in use for extended periods, store the power supply in a dry, dust-free environment.

## 7. TROUBLESHOOTING

This section provides solutions to common issues you might encounter.

Problem	Possible Cause	Solution
No power, displays are off.	<ul style="list-style-type: none"> <li>• Power cord not connected.</li> <li>• Mains outlet faulty.</li> <li>• Blown fuse.</li> </ul>	<ul style="list-style-type: none"> <li>• Check power cord connection.</li> <li>• Test outlet with another device.</li> <li>• Replace fuse (refer to Maintenance section).</li> </ul>
No output voltage/current.	<ul style="list-style-type: none"> <li>• Output terminals not connected.</li> <li>• Voltage/current knobs set to zero.</li> <li>• Over-current protection activated.</li> </ul>	<ul style="list-style-type: none"> <li>• Verify load connections.</li> <li>• Adjust voltage/current knobs.</li> <li>• Check load for short circuit, reduce current limit if necessary.</li> </ul>
Output voltage drops significantly under load.	<ul style="list-style-type: none"> <li>• Current limit set too low (CC mode).</li> <li>• Load draws more current than power supply can provide.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase current limit.</li> <li>• Ensure load requirements are within power supply specifications.</li> </ul>
Unit overheats.	<ul style="list-style-type: none"> <li>• Blocked ventilation.</li> <li>• Operating at maximum capacity for extended periods in high ambient temperature.</li> </ul>	<ul style="list-style-type: none"> <li>• Clear ventilation openings.</li> <li>• Ensure adequate airflow.</li> <li>• Reduce load or operate in a cooler environment.</li> </ul>

## 8. SPECIFICATIONS

Technical specifications for the AFITSEP TPR-3020D DC Power Supply.

Parameter	Value
Model	TPR-3020D
Input Voltage	AC 110V/220V $\pm$ 10% (Switchable)
Output Voltage	0-30V DC (Adjustable)
Output Current	0-20A DC (Adjustable)
Voltage Regulation	CV $\leq$ 0.01% + 3mV
Current Regulation	CC $\leq$ 0.1% + 3mA
Ripple & Noise (Voltage)	$\leq$ 1mV RMS
Ripple & Noise (Current)	$\leq$ 3mA RMS
Display Accuracy	Voltage: $\pm$ 0.5% + 2 digits; Current: $\pm$ 0.5% + 2 digits
Protection	Overload, Over-temperature, Over-voltage, Over-current
Operating Temperature	0°C to 40°C (32°F to 104°F)
Dimensions (L x W x H)	Approx. 1.18 x 0.79 x 0.39 inches (Package Dimensions, actual unit will be larger)
Weight	Approx. 1.1 pounds (500 Grams)

*Note:* Specifications are subject to change without prior notice for product improvement.

## 9. WARRANTY AND SUPPORT

AFITSEP products are designed for reliability and performance. For warranty information and technical support, please refer to the following:

- **Warranty Period:** Please refer to the warranty card included with your product or contact your local distributor for specific warranty terms.
- **Technical Support:** For technical assistance, troubleshooting, or service inquiries, please contact AFITSEP customer support through the retailer where the product was purchased or visit the official AFITSEP website.
- **Online Resources:** Additional resources, FAQs, and software updates (if applicable) may be available on the AFITSEP official website.

Please have your product model number (TPR-3020D) and purchase date available when contacting support.

## 10. PRODUCT VIDEOS

No official product videos from the seller are available for embedding at this time.

