MATRIX MPS-3010H-3C

MATRIX MPS-3010H-3C 3-Channel DC Power Supply User Manual

Model: MPS-3010H-3C | Brand: MATRIX

1. Product Overview

The MATRIX MPS-3010H-3C is a high-precision, 3-channel adjustable DC power supply designed for various applications including laboratory work, electronic repair, and DIY projects. It features two adjustable channels (CH1 and CH2) providing 0-30V / 0-10A each, and one fixed 5V / 3A channel (CH3), with a total power output of up to 615W. The unit offers a 4-digit bright screen display for voltage and current, independent control for CH1 and CH2, and supports 110V/220V input voltage switching.

Key features include high precision (0.03% + 10 mV, 0.1% + 5 mA) and stability with 10 mV, 1 mA resolution and low ripple (2 mVrms, 5 mArms). It incorporates a power-on slow-start circuit for stable and accurate DC output. The power supply allows for easy switching between independent, series, and parallel modes with a single button, eliminating the need for manual wire reconnection. It also supports presetting current and voltage without short circuits. User-friendly features include precision encoder adjustment knobs for accurate value changes, OCP/OVP/OTP protection, an intelligent fan system, and USB, RS-232, and RS-485 interfaces for computer or automated device connectivity.

Figure 1.1: MATRIX MPS-3010H-3C DC Power Supply with test leads and power cord.

2. Safety Instructions

Please read and understand all safety instructions before operating the device. Failure to follow these instructions may result in electric shock, fire, or damage to the product.

- Always connect the power supply to a grounded outlet.
- Do not operate the device in wet or damp conditions.
- Ensure proper ventilation to prevent overheating. Do not block ventilation openings.
- Do not open the casing of the power supply. There are no user-serviceable parts inside. Refer servicing to qualified personnel.
- Verify the input voltage selector (110V/220V) is set correctly for your region before connecting to AC power.
- Use only the provided power cord and test leads, or equivalent replacements that meet safety standards.
- Avoid touching output terminals when the device is powered on.
- Disconnect power before making or changing connections to the output terminals.

3. Package Contents

Carefully unpack the power supply and check for any damage. Retain the packaging for future transport or storage. Verify that all items listed below are included:

- MATRIX MPS-3010H-3C DC Power Supply Unit
- AC Power Cord
- Test Leads (Red and Black)
- User Manual (this document)

4. Product Features

- **3-Channel Output:** Two adjustable channels (0-30V/0-10A) and one fixed channel (5V/3A).
- **High Precision & Resolution:** 10mV / 1mA resolution with 0.03% + 10mV voltage accuracy and 0.1% + 5mA current accuracy.
- **Low Ripple & Noise:** ≤2mVrms and ≤5mArms for stable output.
- **4-Digit Display:** Clear and bright display for voltage and current readings.
- **Series/Parallel Mode:** One-button switching for series or parallel operation without manual rewiring.
- **Preset Function:** Ability to preset current and voltage without short-circuiting the output.
- **Protection Mechanisms:** Over Current Protection (OCP), Over Voltage Protection (OVP), and Over Temperature Protection (OTP).
- **Intelligent Cooling:** Fan system adjusts speed based on temperature to maintain optimal performance.
- **Connectivity:** Equipped with USB, RS-232, and RS-485 interfaces for remote control and automation.
- **Memory Function:** Saves output status and values before shutdown.
- **Buzzer Control:** Buzzer sound can be turned on or off.

Figure 4.1: High precision and stability of the power supply's output.

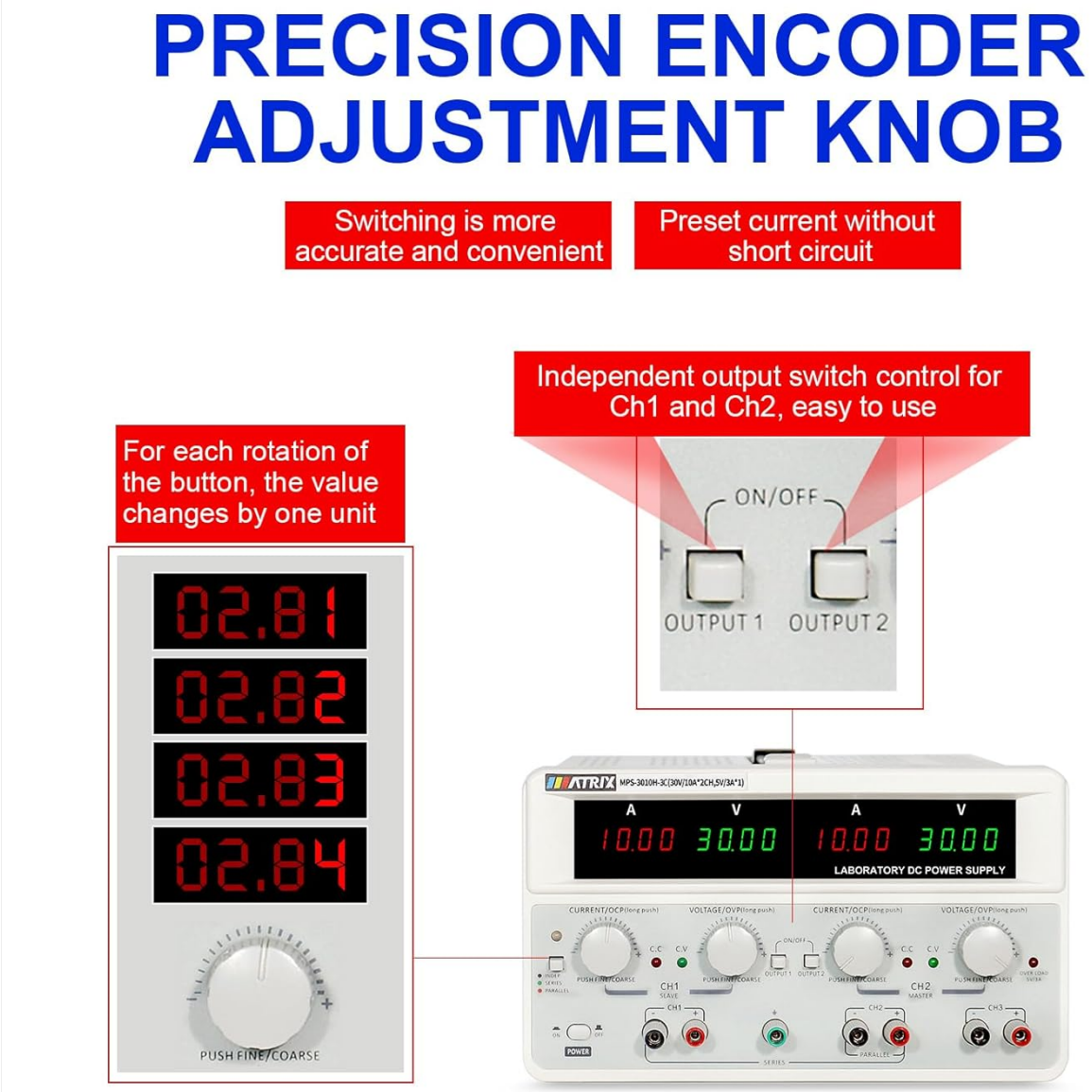

Figure 4.2: Precision encoder adjustment knobs for accurate control and independent output switches.

Figure 4.3: Internal view highlighting the intelligent fan system and intuitive interface features.

5. Setup Guide

5.1 Unpacking and Placement

Remove the power supply from its packaging. Place the unit on a stable, level surface with adequate space around it for ventilation. Ensure that the front and rear panels are easily accessible.

5.2 Connecting AC Power

1. Locate the AC input socket and the AC selector switch on the rear panel of the power supply.
2. **Important:** Before connecting the power cord, ensure the AC selector switch is set to the correct voltage (110V or 220V) for your local power grid. Incorrect setting can damage the unit.
3. Connect the provided AC power cord to the AC input socket on the rear panel.
4. Plug the other end of the AC power cord into a grounded electrical outlet.

① Instrument power input socket
② Instrument power input switch
③ Heat dissipation hole
④ USB interface
⑤ RS-232 interface
⑥ RS-485

Figure 5.1: Rear panel connections, including AC input and voltage selector.

5.3 Connecting Load

Use the provided test leads to connect your load to the output terminals. Ensure correct polarity (red for positive, black for negative). For CH1 and CH2, use the corresponding output terminals. CH3 (fixed 5V) also has dedicated output terminals.

6. Operating Instructions

6.1 Front Panel Overview

The front panel provides all necessary controls and displays for operating the power supply.

Model		MPS-3005H-3C			MPS-3010H-3C		
Rated input voltage		AC220V/110V±10%					
Channel		CH1	CH2	CH3	CH1	CH2	CH3
Rated output	Voltage	0~30V	0~30V	5V	0~30V	0~30V	5V
	Current	0~5A	0~5A	3A	0~10A	0~10A	3A
	Power	315W			615W		
Load regulation rate	Voltage	≤0.01%+5mV		≤15mV	≤0.01%+8mV		≤15mV
	Current	≤0.1%+5mA		-	≤0.1%+5mA		-
Line regulation rate	Voltage	≤0.01%+5mV		-	≤0.01%+8mV		-
	Current	≤0.1%+5mA		-	≤0.1%+5mA		-
Set resolution	Voltage	10mV		-	10mV		-
	Current	1mA		-	1mA		-
Readback resolution	Voltage	10mV		-	10mV		-
	Current	1mA		-	1mA		-
Set value accuracy	Voltage	≤0.03%+10mV		-	≤0.03%+10mV		-
	Current	≤0.1%+5mA		-	≤0.1%+5mA		-
Readback value accuracy	Voltage	≤0.03%+10mV		-	≤0.03%+10mV		-
	Current	≤0.1%+5mA		-	≤0.1%+5mA		-
Parallel mode	Power effect	≤0.01%+5mV		-	≤0.02%+8mV		-
	Load effect	≤0.02%+5mV		-	≤0.02%+8mV		-
Series mode	Power effect	≤0.01%+5mV		-	≤0.01%+8mV		-
	Load effect	≤0.02%+5mV		-	≤0.01%+8mV		-
Ripple and Noise	Voltage	≤2mV(rms)			≤2mV(rms)		
	Current	≤5mA(rms)			≤5mA(rms)		
Working temperature		0~40℃≤80%RH			0~40℃≤80%RH		
Size (W*H*D)	Inch	9.8*5.9*13			9.8*5.9*13		
Weight	lb	19.84			26.46		
Interfaces		RS-232, RS-485, USB			RS-232, RS-485, USB		

Figure 6.1: Front Panel Layout and Controls.

- **CH1 V, A display:** Digital displays for Voltage and Current of Channel 1.
- **CH2 V, A display:** Digital displays for Voltage and Current of Channel 2.
- **CH1 Adjustment knob:** Encoder knob for setting Voltage and Current for Channel 1. Push to switch between coarse/fine adjustment.
- **CH2 Adjustment knob:** Encoder knob for setting Voltage and Current for Channel 2. Push to switch between coarse/fine adjustment.
- **Mode indicator:** Lights indicating CC (Constant Current) or CV (Constant Voltage) mode.
- **Menu:** Button for accessing menu options.
- **CH1, CH2 Output switch:** Buttons to enable/disable output for Channel 1 and Channel 2 independently.
- **Output terminal:** Binding posts for connecting test leads (Red for positive, Black for negative).
- **Power Switch:** Main power ON/OFF switch for the unit.

6.2 Basic Operation (Independent Mode)

1. Ensure the power supply is connected to AC power and the AC selector is correct.
2. Press the main **POWER** switch to turn on the unit. The displays will illuminate.
3. For CH1 or CH2, rotate the respective **VOLTAGE** knob to set the desired output voltage. Push the knob to toggle between coarse and fine adjustment.
4. Rotate the respective **CURRENT** knob to set the desired current limit. This acts as a maximum current the channel will supply.
5. Connect your load to the corresponding output terminals (CH1, CH2, or CH3).
6. Press the **OUTPUT 1** or **OUTPUT 2** switch to enable the output for the selected channel. The output indicator

will light up.

7. The display will show the actual output voltage and current.
8. To disable an output, press its respective **OUTPUT** switch again.

6.3 Series and Parallel Mode

The MPS-3010H-3C allows for easy configuration of CH1 and CH2 in series or parallel mode.

- **Series Mode:** Connect the positive terminal of CH1 to the negative terminal of CH2 using a short wire. Then, use the negative terminal of CH1 and the positive terminal of CH2 as the combined output. Press the **SERIES** button. The voltage will be the sum of CH1 and CH2 voltages, while the current limit will be that of the lower-set channel.
- **Parallel Mode:** Connect the positive terminals of CH1 and CH2 together, and the negative terminals of CH1 and CH2 together. Press the **PARALLEL** button. The current will be the sum of CH1 and CH2 currents, while the voltage will be that of the lower-set channel.

In both series and parallel modes, the display will show the combined current and voltage values, providing intuitive readings.

6.4 Fixed 5V Output (CH3)

The CH3 output provides a fixed 5V at 3A. This channel is always active when the power supply is on and does not have independent ON/OFF control or adjustable settings.

6.5 Protection Features

- **OCP (Over Current Protection):** If the output current exceeds the set limit, the power supply will enter constant current mode (CC) or shut down the output, depending on the setting.
- **OVP (Over Voltage Protection):** If the output voltage exceeds a preset limit, the output will be shut down to protect the connected load.
- **OTP (Over Temperature Protection):** The unit will automatically shut down if its internal temperature exceeds a safe operating limit.

7. Connectivity and Remote Control

The MPS-3010H-3C offers multiple interfaces for remote control and integration into automated systems.

7.1 Interface Overview

Figure 7.1: Rear panel communication interfaces.

- **USB Interface:** For direct connection to a personal computer.
- **RS-232 Interface:** A standard serial communication port.

- **RS-485 Interface:** A robust serial communication standard suitable for longer distances and multi-drop networks.

7.2 Connecting to a Computer

To control the power supply remotely, connect the appropriate cable (USB, RS-232, or RS-485) from the power supply to your computer. You will need to install the necessary drivers and control software, typically available from the MATRIX product support website. Refer to the software documentation for detailed instructions on remote operation and programming.

8. Maintenance

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

- **Cleaning:** Disconnect the power supply from all power sources and loads 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 sides and rear of the unit are clear of dust and obstructions.
- **Storage:** When not in use for extended periods, store the power supply in a dry, dust-free environment.
- **Calibration:** For applications requiring high accuracy, periodic calibration by a qualified service center is recommended.

9. Troubleshooting

This section addresses common issues you might encounter. If the problem persists, contact customer support.

Problem	Possible Cause	Solution
No power when turned on	Power cord not connected; AC selector incorrect; Blown fuse	Check power cord connection; Verify AC selector setting; Replace fuse (refer to service manual or contact support).
No output voltage/current	Output switch OFF; OVP/OCP triggered; Load disconnected or faulty	Press output switch ON; Check OVP/OCP settings and reset if necessary; Verify load connection and functionality.
Incorrect voltage/current reading	Poor connection; Device malfunction	Check test lead connections; Contact customer support for calibration or repair.
Unit overheats	Blocked ventilation; Excessive load	Ensure ventilation openings are clear; Reduce load or operate within specified limits.

10. Technical Specifications

The following table details the technical specifications of the MATRIX MPS-3010H-3C DC Power Supply.

Figure 10.1: Detailed Technical Specifications.

Parameter	Specification
Model	MPS-3010H-3C
Rated Input Voltage	AC220V/110V ±10%
Channel 1 Output	0-30V / 0-10A
Channel 2 Output	0-30V / 0-10A
Channel 3 Output	5V / 3A
Total Power	615W
Voltage Set Resolution	10mV
Current Set Resolution	1mA
Voltage Set Accuracy	≤0.03% + 10mV
Current Set Accuracy	≤0.1% + 5mA
Ripple & Noise (Voltage)	≤2mVrms
Ripple & Noise (Current)	≤5mArms
Working Temperature	0-40°C, ≤80%RH
Product Dimensions (L x W x H)	9.8 x 5.9 x 13 inches
Item Weight	26.4 lb (12 kg)
Interfaces	RS-232, RS-485, USB

11. Warranty and Customer Support

MATRIX TECHNOLOGY INC. provides a 3-year after-sales service for all MATRIX-branded products. For technical assistance, warranty claims, or general inquiries, please contact MATRIX customer support through the official website or your point of purchase. Please have your model number (MPS-3010H-3C) and purchase date available when contacting support.

Related Documents - MPS-3010H-3C

	[MATRIX MPS-H-3 Series Laboratory Power Supplies User Manual] This user manual provides detailed instructions for operating and maintaining the MATRIX MPS-H-3 series laboratory DC power supplies, covering setup, operation, advanced functions, and safety features.
	[2022 Product Manual: DC Linear Power Supplies and Test Equipment] MATRIX TECHNOLOGY INC. offers a comprehensive product manual detailing their range of DC linear power supplies, AC power sources, electronic loads, digital multimeters, oscilloscopes, and other precision test and measurement instruments.
	[MATRIX System User Guide: Setup, Configuration, and Routing] Comprehensive user guide for the MATRIX System, covering setup modes (daisy chain, star), system configuration with and without paging microphones, signal routing via Dante network, paging function setup, and device management. Includes detailed explanations and diagrams.
	[MATRIX XUR, XIR, XER Konsolen Bedienungsanleitung] Umfassende Bedienungsanleitung für die MATRIX XUR, XIR und XER Fitnesskonsolen. Erfahren Sie alles über Einrichtung, Funktionen, Trainingsprogramme, Konnektivität und Wartung Ihrer MATRIX Fitnessgeräte.
	[Matrix EON48 Digital Key Phone User Card and Guide] Comprehensive user card and guide for the Matrix EON48 Digital Key Phone, detailing features, operations, call management, and system administration for telephony systems.
	[Matrix R30 & R50 Service Manual - Johnson Industries] Detailed service manual for Johnson Industries Matrix R30 and R50 recumbent exercise bikes, covering product specifications, console operation, troubleshooting common issues, and step-by-step part replacement procedures.