

Instructions Manual



PS2520 and PS2521 Series Power Supplies

070-9854-02



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PS2520 and PS2521 Series Power Supplies

The Tektronix PS2520, PS2520G, PS2521, and PS2521G power supplies are multifunction benchtop or portable instruments. All PS2520 series power supplies include the following standard features:

- Three high stability low drift outputs (outputs may be configured for independent, series, or parallel operation)
- Automatic series or parallel tracking
- Push-button controls
- Keypad and up-down key data entry
- Four-digit display of voltage and current
- High resolution digital-to-analog converter
- Memory storage and recall
- Display readout of output, memory, and error codes
- Automatic sequencing with timer
- Self-test diagnostic at power up
- Overvoltage protection (OVP) and overcurrent protection (OCP)

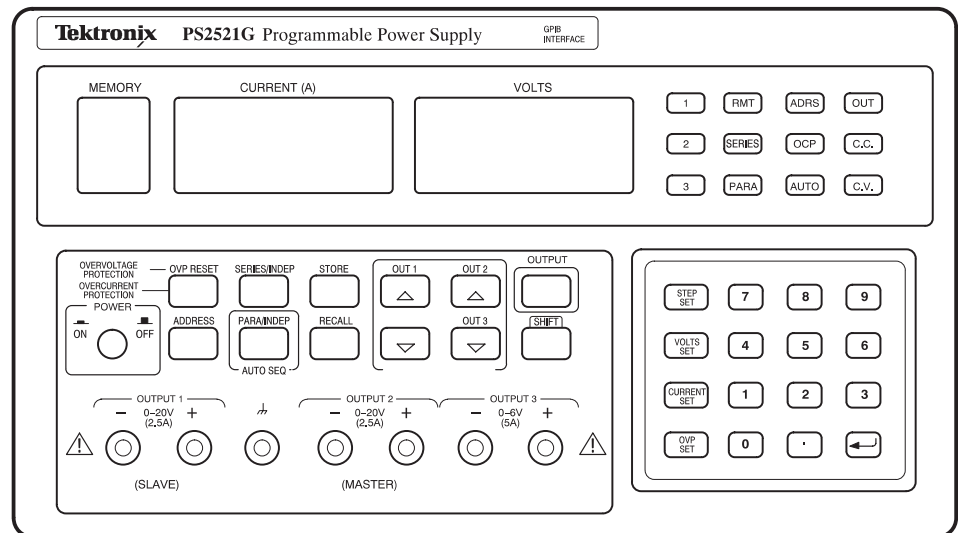


Figure 1: PS2521G power supply

The descriptions and procedures in the following sections apply to all PS2520 series power supplies (unless specifically noted), with the following exceptions:

- The PS2520 and PS2520G power supplies have two variable outputs providing 0 to 36 V at 0 to 1.5 A and one variable output providing 0 to 6 V at 0 to 3A.
- The PS2521 and PS2521G power supplies have two variable outputs providing 0 to 20 V at 0 to 2.5 A and one variable output providing 0 to 6 V at 0 to 5 A.
- The PS2520G and PS2521G include General Purpose Interface Bus (GPIB) operation.

PS2520 and PS2521 Series Specifications

The characteristics listed in this section apply under the following conditions:

- The power supply operates in a 20° to 30° C (68° to 86° F) ambient environment, unless otherwise noted.
- The instrument warms up for at least 20 minutes.

NOTE. All specifications are warranted unless marked “typical.” Typical characteristics are not guaranteed but are provided for the convenience of the user.

Table 1: Operational characteristics

Characteristic	Description
Independent Output Ratings	
PS2520 and PS2520G	Two outputs: 0 to 36 V at 0 to 1.5 A One output: 0 to 6 V at 3 A
PS2521 and PS2521G	Two outputs: 0 to 20 V at 0 to 2.5 A One output: 0 to 6 V at 0 to 5 A
Series Tracking Output Rating	
PS2520 and PS2520G	0 to 72 V at 0 to 1.5 A
PS2521 and PS2521G	0 to 40 V at 0 to 2.5 A
Parallel Tracking Output Rating	
PS2520 and PS2520G	0 to 36 V at 0 to 3 A
PS2521 and PS2521G	0 to 20 V at 0 to 5 A
Maximum Overvoltage Protection	
PS2520 and PS2520G	36 V outputs: 38.5 V 6 V output: 7.0 V
PS2521 and PS2521G	20 V outputs: 22.5 V 6 V output: 7.0 V
Load Effect	
Voltage	Rear output: ≤ 3 mV Front output: ≤ 6 mV
Current	≤ 3 mA (≤ 6 mA if rating current > 3.5 A)
Source Effect	
Voltage	≤ 3 mV
Current	≤ 3 mA

Table 1: Operational characteristics (cont.)

Characteristic	Description
Resolution	
Voltage	10 mV (20 mV if rating voltage > 36 V)
Current	1 mA (2 mA if rating current > 3.5 A)
Overvoltage Protection	10 mV (20 mV if rating voltage > 36 V)
Program Accuracy	
Voltage	$\leq 0.05\% + 25 \text{ mV}$ (50 mV if rating voltage > 36 V)
Current	$\leq 0.2\% + 10 \text{ mA}$
Overvoltage Protection	$\leq 2\% + 0.6 \text{ V}$
Ripple and Noise 20 Hz to 20 MHz	
Voltage Ripple	1 mV _{RMS} (3 mV _{p-p})
Voltage Noise	2 mV _{RMS} (30 mV _{p-p})
Current	$\leq 3 \text{ mA}_{\text{RMS}}$ ($\leq 5 \text{ mA}_{\text{RMS}}$ if rating current > 3.5 A)
Temperature Coefficient 0° to 40° C (32° to 104° F)	
Voltage	$\leq 100 \text{ ppm} + 3 \text{ mV}$
Current	$\leq 150 \text{ ppm} + 3 \text{ mA}$
Readback Resolution	
Voltage	10 mV (20 mV if rating voltage > 36 V)
Current	1 mA (2 mA if rating current > 3.5 A)
Readback Accuracy	
Voltage	$\leq 0.05\% + 25 \text{ mV}$ (50 mV if rating voltage > 36 V)
Current	$\leq 0.2\% + 10 \text{ mA}$
Response Time	
10 to 90% (up)	$\leq 100 \text{ ms}$
90 to 10% (down)	$\leq 100 \text{ ms}$ ($\geq 10\%$ rating load)
Readback Temperature Coefficient	
Voltage	$\leq 100 \text{ ppm} + 10 \text{ mV}$ (20 mV if rating voltage > 36 V)
Current	$\leq 150 \text{ ppm} + 10 \text{ mA}$
Drift ¹	
Voltage	$\leq 0.03\% + 6 \text{ mV}$
Current	$\leq 0.1\% + 6 \text{ mA}$
Series Tracking	
Tracking Error Voltage	$\leq 0.1\% + 50 \text{ mV}$
Load Effect Voltage	$\leq 50 \text{ mV}$
Source Effect Voltage	$\leq 3 \text{ mV}$

¹ Change in output over an 8 hour interval with a constant line voltage, load, and ambient temperature. Requires a 30 minute warm-up.

Table 1: Operational characteristics (cont.)

Characteristic	Description
Parallel Tracking	
Program Accuracy	
Voltage	$\leq 0.05\% + 25 \text{ mV}$ (50 mV if rating voltage > 36 V)
Current	$\leq 0.2\% + 20 \text{ mA}$
Oversvoltage Protection	$\leq 2\% + 0.6 \text{ V}$
Load Effect	
Voltage	$\leq 3 \text{ mV}$ rear output ($\leq 6 \text{ mV}$ front output)
Current	$\leq 6 \text{ mA}$ ($\leq 12 \text{ mA}$ if rating current > 3.5 A)
Source Effect	
Voltage	$\leq 3 \text{ mV}$
Current	$\leq 6 \text{ mA}$
GPIB Capability (Optional IEEE-488.2)	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0, E1
Memory Locations (Store and Recall)	00 to 49 (50 locations)
Timer	
Setting Time	1 to 65535 seconds
Resolution	1 second

Table 2: Electrical characteristics

Characteristic	Description
Power Source	100, 120, and 220 VAC $\pm 10\%$ at 50 to 60 Hz 240 VAC -10% , $+4.2\%$, at 50 to 60 Hz
Safety	ETL listed to UL 1244 Certified to CSA-C22.2 No 231-M89

Table 3: Environmental characteristics

Characteristic	Description
Operating Temperature	0° to 40° C (32° to 104° F)
Nonoperating Temperature	-10° to +70° C (14° to 158° F)

Table 4: Physical characteristics

Characteristic	Description
Width	255 mm (10.04 inch)
Height	145 mm (5.71 inch)
Depth	346 mm (13.62 inch)
Weight	10 kg (22 lbs)

PS2520 and PS2521 Series Performance Verification

This section contains procedures to verify that PS2520, PS2520G, PS2521, or PS2521G power supplies perform as warranted. Implement the performance verification procedures whenever the accuracy or function of your power supply is in question.

The performance verification procedures provide a valid confirmation of instrument electrical characteristics and function under the following conditions:

- The instrument operates in a 20° to 30° C (68° to 86° F) ambient environment.
- The instrument warms up for at least 20 minutes.
- The cabinet remains installed on the instrument.

The performance verification procedure should be performed annually or after every 2000 hours of operation if used infrequently.

The PS2520 series performance verification consists of the checks listed in Table 5.

Table 5: Performance verification checks

Basic Function
Voltage Set Accuracy
Current Set Accuracy
Overvoltage Protection (OVP) Accuracy
Constant Voltage Load Accuracy
Constant Voltage Source Accuracy
Constant Voltage Ripple and Noise Accuracy
Constant Current Load and Overcurrent Protection (OCP) Accuracy
Constant Current Source Accuracy

There are two separate performance verification procedures for the PS2520/2520G and PS2521/2521G series instruments. The PS2520/2520G procedures begin on page 9; the PS2521/2521G procedures begin on page NO TAGNO TAG. Use the procedure appropriate to your instrument.

You will find the recommended test equipment and initial settings for all verification procedures listed on page 8.

Test Equipment

The performance verification procedures use external traceable test equipment to directly check warranted characteristics.

Alternative test equipment must meet or exceed the intended minimum requirements. If you substitute equipment, you may need to modify the procedures.

NOTE. Before beginning the performance verification procedures, warm up the test equipment according to the manufacturer's recommendations.

Table 6: Performance verification test equipment

Description	Minimum requirements	Example product
Digital Multimeter (DMM)	500 V, 10 A, accuracy within $\pm 0.01\%$	Fluke 8505A
Oscilloscope	20 MHz, 3% vertical deflection accuracy	Tektronix TDS300 Series
Electronic Load	40 V, 8 A CR mode	
Variac	0 to 250 V, 2 A	
Resistors	2.2 Ω 50 W, 27 Ω 100 W	

Set Up

Following a 20 minute warm-up period, preset your power supply to the settings listed in Table 7.

Table 7: Power supply initial settings

Control	Setting
(SHIFT) RECALL	Enter 00 on keypad
AUTO SEQ	OFF
(SHIFT)	OUT 1
OCP	OFF
(SHIFT) SERIES/INDEP	INDEP
(SHIFT) PARA/INDEP	INDEP
OUTPUT	OFF
STEP SET (volts)	1
STEP SET (current)	0.1

PS2520 and PS2520G Checks

To verify the function and performance of the PS2520 and PS2520G power supplies, implement the following checks in sequential order. To verify the function and performance of the PS2521 and PS2521G power supplies, see page NO TAG.

NOTE. To clear a memory location, enter “0” as the VOLTS SET and CURRENT SET values; then save the “0” values to the desired memory location.

For a list of error code descriptions, see your User manual.

Basic Function Complete the following procedures to verify basic instrument function.

Outputs 1, 2, and 3. Use the following steps to verify OUTPUT 1, OUTPUT 2, and OUTPUT 3 basic function.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.

2. Set up the power supply as follows:

VOLTS SET	10 V
CURRENT SET	1 A
OVP SET	38 V
DELAY	3 s

3. Press SHIFT → STORE → 1 ← to store the above values in the memory 01 location. Verify that the MEMORY, CURRENT (A), and VOLTS readouts display the values listed in step 2 for memory location 01.

4. Reset the power supply as follows:

VOLTS SET	11 V
CURRENT SET	1.1 A
OVP SET	38 V
DELAY	3 s

5. Press SHIFT → STORE → 2 ← to store the above values in the memory 02 location. Verify that the MEMORY, CURRENT (A), and VOLTS readouts display the values listed in step 4 for memory location 02.

6. Press SHIFT → RECALL; then enter 1.2 ←.

7. Press RECALL LAST; verify that the readouts display the data stored in the memory 02 location.

8. Press RECALL LAST again; verify that the readouts now display the data stored in the memory 01 location.
9. Press RECALL NEXT; verify that the readouts display the data stored in the memory 02 location.
10. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
11. Press AUTO SEQ ON/OFF and verify that the “AUTO” indicator lights up on the display. Verify that the front panel readouts alternately display the memory 01 and memory 02 setups from steps 2 and 4 above, every three seconds.
12. Press AUTO SEQ ON/OFF and OUTPUT ON/OFF. Verify that the “AUTO” and “OUT” indicators turn off.
13. Press STEP SET. Set the VOLTS SET to 1.00 V.
14. Press VOLTS ▾ and verify that as you attempt to decrease the voltage below 0.00 V, “Err - 018” appears on the CURRENT (A) and VOLTS readouts. The voltage should decrease in 1 volt steps on the VOLTS readout.
15. Press VOLTS △ and verify that as you attempt to increase the voltage past 37.00 V, “Err - 016” appears on the readouts. The voltage should increase in 1 volt steps on the VOLTS readout.
16. Press STEP SET. Set the CURRENT SET to .1 A.
17. Press CURRENT ▾ and verify that as you attempt to decrease the current below 0.000 A, “Err - 019” appears on the readouts and the “C.C.” indicator lights. The current should decrease in .1 ampere steps on the CURRENT (A) readout.
18. Press CURRENT △ and verify that as you attempt to increase the current past 1.550 A, “Err - 017” appears on the readouts. The current should increase in .1 ampere steps on the CURRENT (A) readout.

To check the function of OUTPUT 2, press SHIFT → OUT 2. Verify that the “2” indicator lights up on the display; then repeat steps 2 through 18 above.

To check the function of OUTPUT 3, press SHIFT → OUT 3. Verify that the “3” indicator lights up on the display; then continue with the steps below.

19. Set up the power supply as follows:

VOLTS SET	5 V
CURRENT SET	2 A
OVP SET	7 V
DELAY	3 s

20. Press SHIFT → STORE → 1 ← to store the above values in the memory 01 location. Verify that the MEMORY, CURRENT (A), and VOLTS readouts display the values listed in step 19 for memory location 01.
21. Reset the power supply as follows:

VOLTS SET	6 V
CURRENT SET	3 A
DELAY	3 s
22. Press SHIFT → STORE → 2 ← to store the above values in the memory 02 location. Verify that the MEMORY, CURRENT (A), and VOLTS readouts display the values set in step 21 for memory location 02.
23. Repeat steps 6 through 12 above.
24. Press STEP SET. Set the VOLTS SET to 1 V.
25. Press VOLTS ▽ and verify that as you attempt to decrease the voltage below 0.00 V, “Err - 018” appears on the CURRENT (A) and VOLTS readouts. The voltage should decrease in 1 volt steps on the VOLTS readout.
26. Press VOLTS △ and verify that as you attempt to increase the voltage past 6.50 V, “Err - 016” appears on readouts. The voltage should increase in 1 volt steps on the VOLTS readout.
27. Press STEP SET. Set the CURRENT SET to .1 A.
28. Press CURRENT ▽ and verify that as you attempt to decrease the current below 0.000 A, “Err - 019” appears on the readouts and the “C.C.” indicator lights. The current should decrease in .1 ampere steps on the CURRENT (A) readout.
29. Press CURRENT △ and verify that as you attempt to increase the current past 3.100 A, “Err - 017” appears on the readouts. The current should increase in .1 ampere steps on the CURRENT (A) readout.

OCP, Series, and Parallel Mode Indicators. Use the following steps to verify OCP, series, and parallel output indicator function.

1. On the power supply front panel, press OCP ON/OFF to enable the OCP. Verify that the “OCP” indicator lights up on the display.
2. Press OCP ON/OFF. Verify that the “OCP” indicator turns off.
3. Press SHIFT → SERIES/INDEP to configure the power supply outputs for series operation. Verify that the “SERIES” indicator lights up on the display.
4. Press SHIFT → PARA/INDEP to configure the power supply outputs for parallel operation. Verify that the “PARA” indicator lights up on the display.

5. Press SHIFT → PARA/INDEP again to reconfigure the outputs for independent operation. Verify that the “PARA” and “SERIES” indicators turn off.

Set GPIB. Use the following steps to check the GPIB address.

1. Press LOCAL.
2. Enter a GPIB address <0 to 30> and press ↵.
3. Press SHIFT → ADDRESS. Verify that the address entered in step 2 above appears on the readout for about one second.

Voltage Set Accuracy

Complete the following procedures to verify voltage setting and readout accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	36 V
OVP SET	37 V
3. Press STEP SET. Set the VOLTS SET to 0.05 V.
4. Ensure that the power supply output is disabled. Configure the DMM to measure 40 VDC across the front panel OUTPUT 1 (2) terminals.
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Verify that the DMM reads between 35.950 and 36.050 VDC.
7. Press VOLTS △ or VOLTS ▽ to adjust the power supply output voltage until the DMM reads 36.00 VDC.
8. Verify that the power supply VOLTS readout indicates between 35.950 and 36.050 V.
9. Press VOLTS SET. Set the power supply output voltage to 0.1 V.
10. Set the DMM to measure 1 VDC across the power supply OUTPUT 1 (2) terminals.
11. Verify that the DMM reads between 0.0749 and 0.1250 VDC.
12. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

13. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
14. Repeat steps 2 through 12 above to measure the OUTPUT 2 voltage setting and readout accuracy.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.

2. Set up the power supply as follows:

VOLTS SET	6 V
OVP SET	7 V

3. Press STEP SET. Set the VOLTS SET to 0.05 V.
4. Ensure that the power supply output is disabled. Configure the DMM to measure 10 VDC across the power supply front panel OUTPUT 3 terminals.
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Verify that the DMM reads between 5.972 and 6.028 VDC.
7. Press VOLTS Δ or VOLTS ∇ to adjust the power supply output voltage until the DMM reads 6.00 VDC.
8. Verify that the power supply VOLTS readout indicates between 5.950 and 6.050 V.
9. Press VOLTS SET. Set the power supply output voltage to 0.1 V.
10. Set the DMM to measure 1 VDC across the power supply OUTPUT 3 terminals.
11. Verify that the DMM reads between 0.0749 and 0.1250 VDC.
12. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

Series Operation. Use the following steps to check the series mode accuracy.

1. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.

2. Set up the power supply as follows:

VOLTS SET	36 V
OVP SET	37 V

3. Press STEP SET. Set the VOLTS SET to 0.05 V.

4. Ensure that the power supply output is disabled. Configure the DMM to measure 100 VDC across the front panel OUTPUT 2 (+) and OUTPUT 1 (-) terminals.
5. Press SHIFT → SERIES/INDEP to configure OUTPUT 1 and OUTPUT 2 for series operation. Verify that the “SERIES” indicator lights up on the display.
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Verify that the DMM reads between 71.900 and 72.100 VDC.
8. Press VOLTS \triangle or VOLTS ∇ to adjust the power supply output voltage until the DMM reads 72.000 VDC.
9. Verify that the power supply VOLTS readout indicates between 35.950 and 36.050 V.
10. Press VOLTS SET. Set the power supply output voltage to 0.1 V.
11. Set the DMM to measure 1 VDC across the power supply OUTPUT 2 (+) and OUTPUT 1 (-) terminals.
12. Verify that the DMM reads between 0.1498 and 0.2500 VDC.
13. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

Parallel Operation. Use the following steps to check the parallel mode accuracy.

1. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	36 V
OVP SET	37 V
3. Press STEP SET. Set the VOLTS SET to 0.05 V.
4. Ensure that the power supply output is disabled. Configure the DMM to measure 40 VDC across the power supply front panel OUTPUT 2 terminals.
5. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Verify that the DMM reads between 35.950 and 36.050 VDC.
8. Press VOLTS \triangle or VOLTS ∇ to adjust the power supply output voltage until the DMM reads 36.00 VDC.

9. Verify that the power supply VOLTS readout indicates between 35.950 and 36.050 V.
10. Press VOLTS SET. Set the power supply output voltage to 0.1 V.
11. Set the DMM to measure 1 VDC across the power supply OUTPUT 2 terminals.
12. Verify that the DMM reads between 0.0749 and 0.1250 VDC.
13. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
14. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.

Current Set Accuracy

Complete the following procedures to verify current setting and readout accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	10 V
CURRENT SET	1.5 A
OVP SET	11 V
3. Press STEP SET. Set the CURRENT SET to 0.002 A.
4. Ensure that the power supply output is disabled. Configure the DMM to measure 2 amperes DC across the front panel OUTPUT 1 (2) terminals.
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Verify that the DMM reads between 1.487 and 1.513 A.
7. Press CURRENT \triangle or CURRENT ∇ to adjust the power supply output current until the DMM reads 1.500 A.
8. Verify that the power supply CURRENT (A) readout indicates between 1.487 and 1.513 A.
9. Press CURRENT SET. Set the power supply output current to 0.1 A.
10. Verify that the DMM reads between 0.089 and 0.111 A.
11. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

12. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
13. Repeat steps 2 through 11 above to measure the OUTPUT 2 current setting and readout accuracy.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	3 A
OVP SET	7 V
3. Press STEP SET. Set the CURRENT SET to 0.002 A.
4. Ensure that the power supply output is disabled. Configure the DMM to measure 10 amperes DC across the front panel OUTPUT 3 terminals.
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Verify that the DMM reads between 2.984 and 3.016 A.
7. Press CURRENT \triangle or CURRENT ∇ to adjust the power supply output current until the DMM reads 3.000 A.
8. Verify that the power supply CURRENT (A) readout indicates between 2.984 and 3.016 A.
9. Press CURRENT SET. Set the power supply output current to 0.1 A
10. Verify that the DMM reads between 0.089 and 0.111 A.
11. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

Parallel Operation. Use the following steps to the check parallel mode accuracy.

1. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	10 V
CURRENT SET	1.5 A
OVP SET	11 V
3. Press STEP SET. Set the CURRENT SET to 0.002 A.

4. Ensure that the power supply output is disabled. Configure the DMM to measure 10 amperes DC across the power supply front panel OUTPUT 2 terminals.
5. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Verify that the DMM reads between 2.974 and 3.026 A.
8. Press CURRENT \triangle or CURRENT ∇ to adjust the power supply output current until the DMM reads 3.000 A.
9. Verify that the power supply CURRENT (A) readout indicates between 2.974 and 3.026 A.
10. Press CURRENT SET. Set the power supply output current to 0.1 A.
11. Verify that the DMM reads between 0.089 and 0.111 A.
12. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
13. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.
14. Disconnect the DMM from the power supply output terminals.

Overvoltage Protection Accuracy

Complete the following procedures to verify OVP (overvoltage protection) accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Press OVP SET; set the OVP to 38.6 V. Verify that the power supply readouts display the error message “Err - 065”.
3. Press OVP SET again; set the OVP to 38.5 V. Verify that the power supply readouts display no error message.
4. Set up the power supply as follows:

VOLTS SET	34.5 V
CURRENT SET	.1 A
OVP SET	36 V
5. Press STEP SET. Set the VOLTS SET to 0.02 V.

6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Press VOLTS Δ to increase the power supply output voltage until the error message “Err - 013” appears on the readouts. Verify that this event occurs between 34.68 and 37.32 V.
8. Press SHIFT → OVP RESET.
9. Reset the output voltage to 34.5 V.
10. Repeat steps 6 through 9 above as necessary to determine the exact voltage.
11. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
12. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
13. Repeat steps 2 through 11 above.

Parallel Operation. Use the following steps to check the parallel mode output accuracy.

1. With the power supply still set to OUT 2, press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
2. Repeat steps 2 through 11 of the *Outputs 1 and 2* procedure above.
3. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Press OVP SET; set the OVP to 7.1 V. Verify that the power supply readouts display the error message “Err - 065”.
3. Press OVP SET again; set the OVP to 7 V. Verify that power supply readouts display no error message.

4. Set up the power supply as follows:

VOLTS SET	4 V
CURRENT SET	.1 A
OVP SET	5 V

5. Press STEP SET. Set the VOLTS SET to 0.02 V.
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.

7. Press VOLTS Δ to increase the power supply output voltage until the error message “Err - 013” appears on the readouts. Verify that the readouts indicate between 4.3 and 5.7 V prior to error message activation.
8. Press SHIFT → OVP RESET.
9. Reset the output voltage to 4 V.
10. Repeat steps 6 through 9 above as necessary to determine the exact voltage.
11. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

Constant Voltage Load Accuracy

Complete the following procedures to verify constant voltage load accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 1 terminals. See Figure 2 for details.

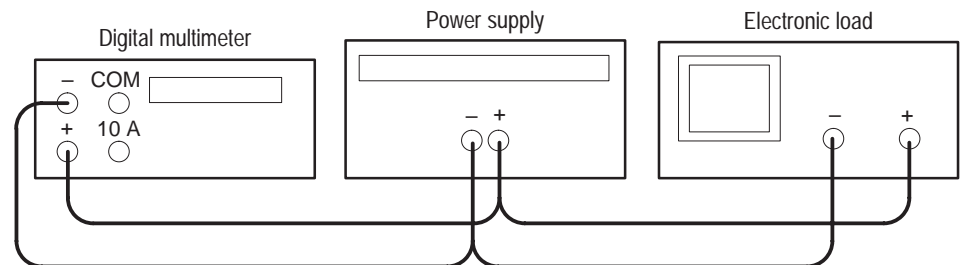


Figure 2: Constant voltage load test setup

3. Set the DMM to measure 40 VDC.
4. Set up the power supply as follows:

VOLTS SET	36 V
CURRENT SET	1.55 A
OVP SET	38.5 V
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 1.500 A.

7. Record the DMM voltage (V1).
8. Turn off the electronic load and record the DMM voltage again (V2).
9. Verify that the difference between V1 and V2 is ≤ 6 mV.
10. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
11. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 1 terminals and connect them to the OUTPUT 1 terminals on the rear of the instrument. Maintain the equipment configuration and polarities shown in Figure 2.
12. Repeat steps 5 through 8 above and verify that the difference between V1 and V2 is ≤ 3 mV.
13. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
14. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
15. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 2.
16. Repeat steps 4 through 10 above.
17. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 2 terminals and connect them to the OUTPUT 2 terminals on the rear of the instrument. Maintain the equipment configuration and polarities shown in Figure 2.
18. Repeat steps 5 through 8 above and verify that the difference between V1 and V2 is ≤ 3 mV.
19. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
20. Disconnect the DMM and electronic load from the instrument.

Series Operation. Use the following steps to check the series mode output accuracy.

1. With the power supply set to OUT 2, press SHIFT → SERIES/INDEP to configure OUTPUT 1 and OUTPUT 2 for series operation. Verify that the “SERIES” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 (+) and OUTPUT 1 (–) terminals. Maintain the equipment configuration and polarities shown in Figure 2.
3. Perform steps 5 through 8 of the *Outputs 1 and 2* procedure above.

4. Verify that the difference between V1 and V2 is ≤ 50 mV.
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
6. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 2 and OUTPUT 1 terminals and connect them to the OUTPUT 2 (+) and OUTPUT 1 (–) terminals on the rear of the instrument. Maintain the equipment configuration and polarities shown in Figure 2.
7. Repeat steps 5 through 8 of the *Outputs 1 and 2* procedure above and verify that the difference between V1 and V2 is ≤ 50 mV.
8. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
9. Disconnect the DMM and electronic load from the instrument.

Parallel Operation. Use the following steps to check the parallel mode output accuracy.

1. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 2.
3. Set the DMM to measure 40 VDC.
4. Set up the power supply as follows:

VOLTS SET	36 V
CURRENT SET	3.1 A
OVP SET	38.5 V
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 3.000 A.
7. Record the DMM voltage (V1).
8. Turn off the electronic load and record the DMM voltage again (V2).
9. Verify that the difference between V1 and V2 is ≤ 6 mV.
10. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
11. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 2 terminals and connect them to the OUTPUT 2 terminals on the rear of the instrument. Maintain the equipment configuration and polarities shown in Figure 2.

12. Repeat steps 5 through 8 above and verify that the difference between V1 and V2 is ≤ 3 mV.
13. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
14. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.
15. Disconnect the DMM and electronic load from the instrument.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 3 terminals. Maintain the equipment configuration and polarities shown in Figure 2.
3. Set the DMM to measure 10 VDC.
4. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	3.1 A
OVP SET	7 V
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 3.000 A.
7. Record the DMM voltage (V1).
8. Turn off the electronic load and record the DMM voltage again (V2).
9. Verify that the difference between V1 and V2 is ≤ 6 mV.
10. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
11. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 3 terminals and connect them to OUTPUT 3 on the rear of the instrument. Maintain the equipment configuration and polarities shown in Figure 2.
12. Repeat steps 5 through 8 above and verify that the difference between V1 and V2 is ≤ 3 mV.
13. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
14. Disconnect the DMM and electronic load from the instrument.

Constant Voltage Source Accuracy

Complete the following procedures to verify constant voltage source accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Set up the Variac. Connect the power supply AC input to the Variac variable output. Allow 20 minutes for the power supply to warm-up and stabilize.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 1 terminals. See Figure 3 for details.

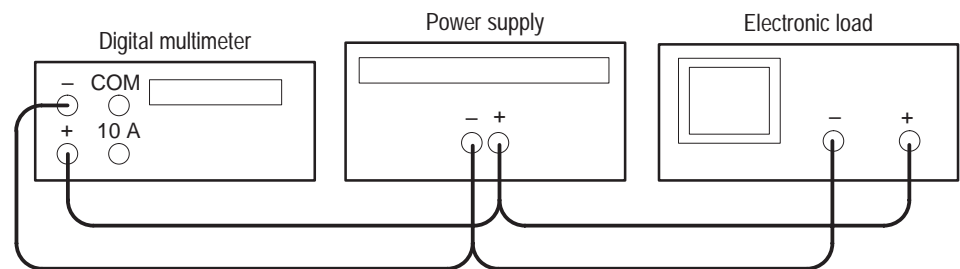


Figure 3: Constant voltage source test setup

3. Set the DMM to measure 40 VDC.
4. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
5. Set up the power supply as follows:

VOLTS SET	36 V
CURRENT SET	1.55 A
OVP SET	38.5 V
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 1.500 A.
8. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the DMM readout changes ≤ 0.003 V over the adjustment range.
9. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off; then disable the electronic load.
10. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.

11. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 1 terminals and connect them to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 3.
12. Repeat steps 5 through 9 above.

Series Operation. Use the following steps to check the series mode output accuracy.

1. Press SHIFT → SERIES/INDEP to configure OUTPUT 1 and OUTPUT 2 for series operation. Verify that the “SERIES” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 (+) and OUTPUT 1 (–) terminals. Maintain the equipment configuration and polarities shown in Figure 3.
3. Repeat steps 5 through 9 of the *Outputs 1 and 2* procedure above.

Parallel Operation. Use the following steps to check the parallel mode output accuracy.

1. Keep the power supply set to OUT 2. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 3.
3. Set the DMM to 40 VDC.
4. Set up the power supply as follows:

VOLTS SET	36 V
CURRENT SET	3.1 A
OVP SET	38.5 V
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 3.000 A.
7. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the DMM readout changes ≤ 0.003 volts over the adjustment range.

8. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off; then disable the electronic load.
9. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 3 terminals. Maintain the equipment configuration and polarities shown in Figure 3.

3. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	3.1 A
OVP SET	7 V

4. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
5. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 3.000 A.
6. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the DMM readout changes ≤ 0.003 V over the adjustment range.
7. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off; then disable the electronic load.
8. Disconnect the DMM and electronic load from the instrument.

Constant Voltage Ripple and Noise Accuracy

Complete the following procedures to verify constant voltage ripple and noise accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the oscilloscope and 27 Ω 100 W resistor to the front panel OUTPUT 1 terminals. See Figure 4 for details.

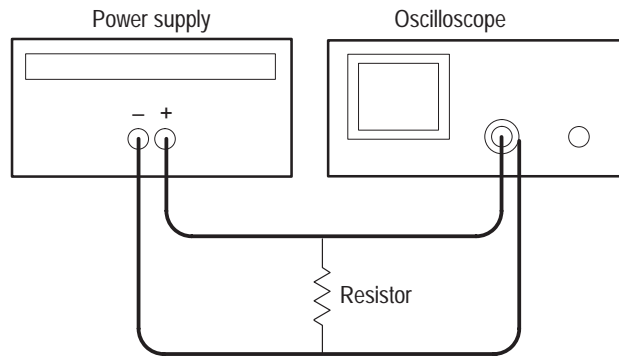


Figure 4: Constant voltage ripple and noise test setup

3. Set up the oscilloscope to measure $100 \text{ mV}_{\text{p-p}}$ (AC coupled),
4. Set up the power supply as follows:

VOLTS SET	36 V
CURRENT SET	1.55 A
OVP SET	38.5 V
5. Press OUTPUT ON/OFF. Verify that the “C.V.” indicator lights up on the display.
6. Using a $0.1 \mu\text{F}$ ceramic capacitor to decouple the test points, adjust the oscilloscope and verify that the noise is $\leq 30 \text{ mV}_{\text{p-p}}$.
7. Set the oscilloscope to LINE trigger source. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the ripple changes $\leq 3 \text{ mV}_{\text{p-p}}$ over the adjustment range.
8. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
9. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
10. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 1 terminals and connect them to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 4.
11. Repeat steps 4 through 8 above.

Outputs 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.

2. Ensure that the power supply output is disabled. Connect the oscilloscope and 2.2 Ω 50 W resistor to the front panel OUTPUT 3 terminals. See Figure 4 for details.
3. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	3.1 A
OVP SET	7 V
4. Repeat steps 5 through 8 of the *Outputs 1 and 2* procedure above.
5. Remove the Variac from the test setup and repower the instrument. Allow 20 minutes for the power supply to warm-up and stabilize before the next check.

Constant Current Load and Overcurrent Protection Accuracy

Complete the following procedures to verify constant current load and overcurrent protection accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 1 terminals. See Figure 5 for details.

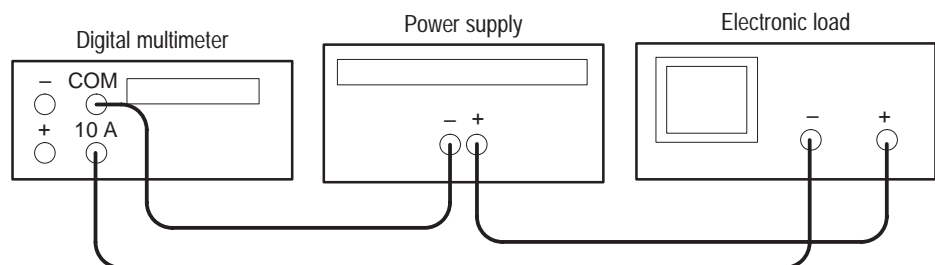


Figure 5: Constant current load test setup

3. Set the DMM to measure 2 amperes DC.
4. Set up the power supply as follows:

VOLTS SET	36 V
CURRENT SET	1.5 A
OVP SET	38.5 V

5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Enable the electronic load. Adjust the load until the “C.C.” indicator lights up on the power supply display.
7. Record the DMM current reading (I1).
8. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
9. Ensure that the power supply output is disabled. Remove the wire connecting the power supply OUTPUT (+) terminal to the electronic load (+) terminal.
10. Move the electronic load (–) connection, to the power supply OUTPUT (+) terminal.
11. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
12. Record the DMM current reading again (I2).
13. Verify that the difference between (I1) and (I2) is ≤ 0.003 A.
14. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
15. Press OCP ON/OFF. Verify that the “OCP” indicator lights up on the display.
16. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
17. Verify that the power supply readouts display the error message “Err - 012”.
18. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
19. Press OCP ON/OFF to return the power supply to normal operation. Verify that the “OCP” indicator turns off.
20. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
21. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 5.
22. Repeat steps 4 through 18 above.

Parallel Operation. Use the following steps to check the parallel mode output accuracy.

1. Keep the power supply set to OUT 2. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
2. Set the DMM to measure 5 amperes DC.
3. Set up the power supply as follows:

VOLTS SET	36 V
CURRENT SET	3.0 A
OVP SET	38.5 V
4. Repeat steps 5 through 14 of the *Outputs 1 and 2* procedure above but verify that the difference between (I1) and (I2) is ≤ 0.006 A.
5. Repeat steps 15 through 18 of the *Outputs 1 and 2* procedure above.
6. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 3 terminals. Maintain the equipment configuration and polarities shown in Figure 5.
3. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	3.0 A
OVP SET	7 V
4. Repeat steps 5 through 18 of the *Outputs 1 and 2* procedure above.
5. Disconnect the DMM and electronic load from the instrument.

Constant Current Source Accuracy

Complete the following procedures to verify constant current source accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Set up the Variac. Connect the power supply AC input to the Variac variable output. Allow 20 minutes for the power supply to warm up and stabilize.

2. Ensure that the power supply output is disabled. Connect the DMM and 27 Ω 100 W resistor to the front panel OUTPUT 1 terminals. See Figure 6 for details.

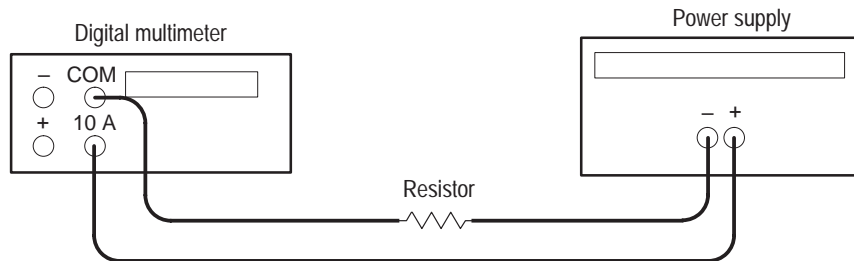


Figure 6: Constant current source test setup

3. Set the DMM to measure 2 amperes DC.
4. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
5. Set up the power supply as follows:

VOLTS SET	36 V
CURRENT SET	1.5 A
OVP SET	38.5 V
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the DMM current variation is ≤ 0.003 A over the adjustment range.
8. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
9. Press (SHIFT) OUT 2; verify that the “2” indicator lights up on the display.
10. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 1 terminals and connect them to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 6.
11. Repeat steps 5 to 8 above.

Parallel Operation. Use the following steps to check the parallel mode output accuracy.

1. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.

2. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
3. Set the DMM to measure 5 amperes DC.
4. Set up the power supply as follows:

VOLTS SET	36 V
CURRENT SET	3.0 A
OVP SET	38.5 V
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the DMM current variation is ≤ 0.006 A over the adjustment range.
7. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
8. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and 2.2 Ω 50 W resistor to the front panel OUTPUT 3 terminals. See Figure 6 for details.
3. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	3.0 A
OVP SET	7 V
4. Repeat steps 6 through 8 of the *Outputs 1 and 2* procedure above.

This concludes the PS2520 and PS2520G performance verification procedures.

PS2521 and PS2521G Checks

To verify the performance and function of the PS2521 and PS2521G power supplies, implement the following checks in sequential order. To verify the performance and function of the PS2520 and PS2520G power supplies, see page 9. The test equipment for all verification procedures is listed on page 8.

NOTE. To clear a memory location, enter “0” as the VOLTS SET and CURRENT SET values; then save the “0” values to the desired memory location.

For a list of error code descriptions, see your User manual.

Basic Function Complete the following procedures to verify basic instrument function.

Outputs 1, 2, and 3. Use the following steps to verify OUTPUT 1, OUTPUT 2, and OUTPUT 3 basic function.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.

2. Set up the power supply as follows:

VOLTS SET	10 V
CURRENT SET	1 A
OVP SET	22 V
DELAY	3 s

3. Press SHIFT → STORE → 1 ← to store the above values in the memory 01 location. Verify that the MEMORY, CURRENT (A), and VOLTS readouts display the values listed in step 2 for memory location 01.

4. Reset the power supply as follows:

VOLTS SET	11 V
CURRENT SET	1.1 A
OVP SET	22 V
DELAY	3 s

5. Press SHIFT → STORE → 2 ← to store the above values in the memory 02 location. Verify that the MEMORY, CURRENT (A), and VOLTS readouts display the values listed in step 4 for memory location 02.

6. Press SHIFT → RECALL; then enter 1.2 ←.

7. Press RECALL LAST; verify that the readouts display the data stored in the memory 02 location.

8. Press RECALL LAST again; verify that the readouts now display the data stored in the memory 01 location.
9. Press RECALL NEXT; verify that the readouts display the data stored in the memory 02 location.
10. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
11. Press AUTO SEQ ON/OFF and verify that the “AUTO” indicator lights up on the display. Verify that the front panel readouts alternately display the memory 01 and memory 02 setups from steps 2 and 4 above, every three seconds.
12. Press AUTO SEQ ON/OFF and OUTPUT ON/OFF. Verify that the “AUTO” and “OUT” indicators turn off.
13. Press STEP SET. Set the VOLTS SET to 1.00 V.
14. Press VOLTS ∇ and verify that as you attempt to decrease the voltage below 0.00 V, “Err - 018” appears on the CURRENT (A) and VOLTS readouts. The voltage should decrease in 1 volt steps on the VOLTS readout.
15. Press VOLTS \triangle and verify that as you attempt to increase the voltage past 21.00 V, “Err - 016” appears on the readouts. The voltage should increase in 1 volt steps on the VOLTS readout.
16. Press STEP SET. Set the CURRENT SET to .1 A.
17. Press CURRENT ∇ and verify that as you attempt to decrease the current below 0.000 A, “Err - 019” appears on the readouts and the “C.C.” indicator lights up on the display. The current should decrease in .1 ampere steps on the CURRENT (A) readout.
18. Press CURRENT \triangle and verify that as you attempt to increase the current past 2.500 A, “Err - 017” appears on the readouts. The current should increase in .1 ampere steps on the CURRENT (A) readout.

To check the function of OUTPUT 2, press SHIFT → OUT 2. Verify that the “2” indicator lights up on the display; then repeat steps 2 through 18 above.

To check the function of OUTPUT 3, press SHIFT → OUT 3. Verify that the “3” indicator lights up on the display; then continue with the steps below.

19. Set up the power supply as follows:

VOLTS SET	5 V
CURRENT SET	4 A
OVP SET	7 V
DELAY	3 s

20. Press SHIFT → STORE → 1 ←↵ to store the above values in the memory 01 location. Verify that the MEMORY, CURRENT (A), and VOLTS readouts display the values listed in step 19 for memory location 01.
21. Reset the power supply as follows:

VOLTS SET	6 V
CURRENT SET	5 A
DELAY	3 s
22. Press SHIFT → STORE → 2 ←↵ to store the above values in the memory 02 location. Verify that the MEMORY, CURRENT (A), and VOLTS readouts display the values set in step 21 for memory location 02.
23. Repeat steps 6 through 12 above.
24. Press STEP SET. Set the VOLTS SET to 1 V.
25. Press VOLTS ▽ and verify that as you attempt to decrease the voltage below 0.00 V, “Err - 018” appears on the CURRENT (A) and VOLTS readouts. The voltage should decrease in 1 volt steps on the VOLTS readout.
26. Press VOLTS △ and verify that as you attempt to increase the voltage past 6.00 V, “Err - 016” appears on readouts. The voltage should increase in 1 volt steps on the VOLTS readout.
27. Press STEP SET. Set the CURRENT SET to .1 A.
28. Press CURRENT ▽ and verify that as you attempt to decrease the current below 0.000 A, “Err - 019” appears on the readouts and the “C.C.” indicator lights. The current should decrease in .1 ampere steps on the CURRENT (A) readout.
29. Press CURRENT △ and verify that as you attempt to increase the current past 5.100 A, “Err - 017” appears on the readouts. The current should increase in .1 ampere steps on the CURRENT (A) readout.

OCP, Series, and Parallel Mode Indicators. Use the following steps to verify OCP, series, and parallel output indicator function.

1. On the power supply front panel, press OCP ON/OFF to enable the OCP. Verify that the “OCP” indicator lights up on the display.
2. Press OCP ON/OFF. Verify that the “OCP” indicator turns off.
3. Press SHIFT → SERIES/INDEP to configure the power supply outputs for series operation. Verify that the “SERIES” indicator lights up on the display.
4. Press SHIFT → PARA/INDEP to configure the power supply outputs for parallel operation. Verify that the “PARA” indicator lights up on the display.

5. Press SHIFT → PARA/INDEP again to reconfigure the outputs for independent operation. Verify that the “PARA” and “SERIES” indicators turn off.

Set GPIB. Use the following steps to check the GPIB address.

1. Press LOCAL.
2. Enter a GPIB address <0 to 30> and press ←.
3. Press SHIFT → ADDRESS. Verify that the address entered in step 2 above appears on the readout for about one second.

Voltage Set Accuracy

Complete the following procedures to verify voltage setting and readout accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	20 V
OVP SET	22 V
3. Press STEP SET. Set the VOLTS SET to 0.05 V.
4. Ensure that the power supply output is disabled. Configure the DMM to measure 25 VDC across the front panel OUTPUT 1 (2) terminals.
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Verify that the DMM reads between 19.965 and 20.035 VDC.
7. Press VOLTS △ or VOLTS ▽ to adjust the power supply output voltage until the DMM reads 20.00 VDC.
8. Verify that the power supply VOLTS readout indicates between 19.965 and 20.035 V.
9. Press VOLTS SET. Set the power supply output voltage to 0.1 V.
10. Set the DMM to measure 1 VDC across the power supply OUTPUT 1 (2) terminals.
11. Verify that the DMM reads between 0.0749 and 0.1250 VDC.
12. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

13. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
14. Repeat steps 2 through 12 above to measure the OUTPUT 2 voltage setting and readout accuracy.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	6 V
OVP SET	7 V
3. Press STEP SET. Set the VOLTS SET to 0.05 V.
4. Ensure that the power supply output is disabled. Configure the DMM to measure 10 VDC across the power supply front panel OUTPUT 3 terminals.
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Verify that the DMM reads between 5.972 and 6.028 VDC.
7. Press VOLTS \triangle or VOLTS ∇ to adjust the power supply output voltage until the DMM reads 6.00 VDC.
8. Verify that the power supply VOLTS readout reads between 5.950 and 6.050 V.
9. Press VOLTS SET. Set the power supply output voltage to 0.1 V.
10. Set the DMM to measure 1 VDC across the power supply OUTPUT 3 terminals.
11. Verify that the DMM reads between 0.0749 and 0.1250 VDC.
12. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

Series Operation. Use the following steps to check the series mode accuracy.

1. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	20 V
OVP SET	22 V
3. Press STEP SET. Set the VOLTS SET to 0.05 V.

4. Ensure that the power supply output is disabled. Configure the DMM to measure 50 VDC across the front panel OUTPUT 2 (+) and OUTPUT 1 (-) terminals.
5. Press SHIFT → SERIES/INDEP to configure OUTPUT 1 and OUTPUT 2 for series operation. Verify that the “SERIES” indicator lights up on the display.
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Verify that the DMM reads between 39.930 and 40.070 VDC.
8. Press VOLTS \triangle or VOLTS ∇ to adjust the power supply output voltage until the DMM reads 40.000 VDC.
9. Verify that the power supply VOLTS readout indicates between 19.965 and 20.035 V.
10. Press VOLTS SET. Set the power supply output voltage to 0.1 V.
11. Set the DMM to measure 1 VDC across the power supply OUTPUT 2 (+) and OUTPUT 1 (-) terminals.
12. Verify that the DMM reads between 0.1498 and 0.2500 VDC.
13. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

Parallel Operation. Use the following steps to check the parallel mode accuracy.

1. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	20 V
OVP SET	22 V
3. Press STEP SET. Set the VOLTS SET to 0.05 V.
4. Ensure that the power supply output is disabled. Configure the DMM to measure 25 VDC across the power supply front panel OUTPUT 2 terminals.
5. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Verify that the DMM reads between 19.965 and 20.035 VDC.
8. Press VOLTS \triangle or VOLTS ∇ to adjust the power supply output voltage until the DMM reads 20.00 VDC.

9. Verify that the power supply VOLTS readout indicates between 19.965 and 20.035 V.
10. Press VOLTS SET. Set the power supply output voltage to 0.1 V.
11. Set the DMM to measure 1 VDC across the power supply OUTPUT 2 terminals.
12. Verify that the DMM reads between 0.0749 and 0.1250 VDC.
13. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
14. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.

Current Set Accuracy

Complete the following procedures to verify current setting and readout accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	10 V
CURRENT SET	2.5 A
OVP SET	11 V
3. Press STEP SET. Set the CURRENT SET to 0.002 A.
4. Ensure that the power supply output is disabled. Configure the DMM to measure 10 amperes DC across the front panel OUTPUT 1 (2) terminals.
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Verify that the DMM reads between 2.485 and 2.515 A.
7. Press CURRENT \triangle or CURRENT ∇ to adjust the power supply output current until the DMM reads 2.500 A.
8. Verify that the power supply CURRENT (A) readout indicates between 2.485 and 2.515 A.
9. Press CURRENT SET. Set the power supply output current to 0.1 A.
10. Verify that the DMM reads between 0.089 and 0.111 A.
11. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

12. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
13. Repeat steps 2 through 11 above to measure the OUTPUT 2 current setting and readout accuracy.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	5 A
OVP SET	7 V
3. Press STEP SET. Set the CURRENT SET to 0.002 A.
4. Ensure that the power supply output is disabled. Configure the DMM to measure 10 amperes DC across the front panel OUTPUT 3 terminals.
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Verify that the DMM reads between 4.980 and 5.020 A.
7. Press CURRENT \triangle or CURRENT ∇ to adjust the power supply output current until the DMM reads 5.000 A.
8. Verify that the power supply CURRENT (A) readout indicates between 4.980 and 5.020 A.
9. Press CURRENT SET. Set the power supply output current to 0.1 A.
10. Verify that the DMM reads between 0.089 and 0.111 A.
11. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

Parallel Operation. Use the following steps to the check parallel mode accuracy.

1. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
2. Set up the power supply as follows:

VOLTS SET	10 V
CURRENT SET	2.5 A
OVP SET	11 V
3. Press STEP SET. Set the CURRENT SET to 0.002 A.

4. Ensure that the power supply output is disabled. Configure the DMM to measure 10 amperes DC across the power supply front panel OUTPUT 2 terminals.
5. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Verify that the DMM reads between 4.970 and 5.030 A.
8. Press CURRENT \triangle or CURRENT ∇ to adjust the power supply output current until the DMM reads 5.000 A.
9. Verify that the power supply CURRENT (A) readout indicates between 4.970 and 5.030 A.
10. Press CURRENT SET. Set the power supply output current to 0.1 A.
11. Verify that the DMM reads between 0.089 and 0.111 A.
12. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
13. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.
14. Disconnect the DMM from the power supply output terminals.

**Overvoltage
Protection Accuracy**

Complete the following procedures to verify OVP (overvoltage protection) accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Press OVP SET and set the OVP to 22.6 V. Verify that the power supply readouts display the error message “Err - 065”.
3. Press OVP SET again and set the OVP to 22.5 V. Verify that the power supply readouts display no error message.
4. Set up the power supply as follows:

VOLTS SET	18 V
CURRENT SET	.1 A
OVP SET	20 V
5. Press STEP SET. Set the VOLTS SET to 0.02 V.

6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Press VOLTS Δ to increase the power supply output voltage until the error message “Err - 013” appears on the readouts. Verify that this event occurs between 19.00 and 21.00 V.
8. Press SHIFT → OVP RESET.
9. Reset the output voltage to 18 V.
10. Repeat steps 6 through 9 above as necessary to determine the exact voltage.
11. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
12. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
13. Repeat steps 2 through 11 above.

Parallel Operation. Use the following steps to check the parallel mode output accuracy.

1. With the power supply still set to OUT 2, press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
2. Repeat steps 2 through 11 of the *Outputs 1 and 2* procedure above.
3. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Press OVP SET; set the OVP to 7.1 V. Verify that the power supply readouts display the error message “Err - 065”.
3. Press OVP SET again; set the OVP to 7 V. Verify that power supply readouts display no error message.

4. Set up the power supply as follows:

VOLTS SET	4 V
CURRENT SET	.1 A
OVP SET	5 V

5. Press STEP SET. Set the VOLTS SET to 0.02 V.
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.

7. Press VOLTS Δ to increase the power supply output voltage until the error message “Err - 013” appears on the readouts. Verify that this event occurs between 4.3 and 5.7 V.
8. Press SHIFT → OVP RESET.
9. Reset the output voltage to 4 V.
10. Repeat steps 6 through 9 above as necessary to determine the exact voltage.
11. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.

Constant Voltage Load Accuracy

Complete the following procedures to verify constant voltage load accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 1 terminals. See Figure 2 for details.

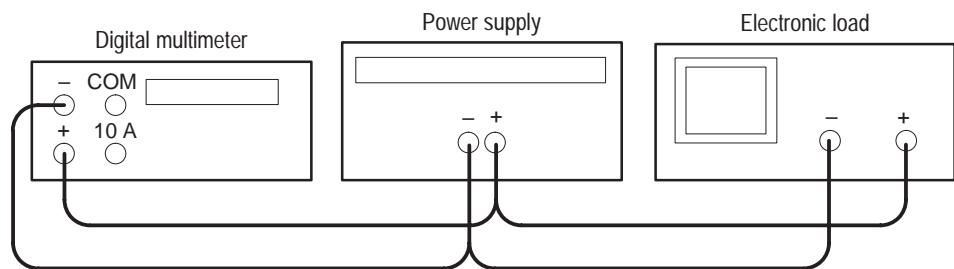


Figure 7: Constant voltage load test setup

3. Set the DMM to measure 25 VDC.
4. Set up the power supply as follows:

VOLTS SET	20 V
CURRENT SET	2.55 A
OVP SET	22 V
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 2.500 A.

7. Record the DMM voltage (V1).
8. Turn off the electronic load and record the DMM voltage again (V2).
9. Verify that the difference between V1 and V2 is ≤ 6 mV.
10. Press OUTPUT OFF. Verify that the “OUT” indicator turns off.
11. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 1 terminals and connect them to the OUTPUT 1 terminals on the rear of the instrument. Maintain the equipment configuration and polarities shown in Figure 2.
12. Repeat steps 5 through 8 above and verify that the difference between V1 and V2 is ≤ 3 mV.
13. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
14. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
15. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 2.
16. Repeat steps 4 through 10 above.
17. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 2 terminals and connect them to the rear panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 2.
18. Repeat steps 5 through 8 above and verify that the difference between V1 and V2 is ≤ 3 mV.
19. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
20. Disconnect the DMM and electronic load from the instrument.

Series Operation. Use the following steps to check the series mode output accuracy.

1. With the power supply set to OUT 2, press SHIFT → SERIES/INDEP to configure OUTPUT 1 and OUTPUT 2 for series operation. Verify that the “SERIES” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 (+) and OUTPUT 1 (–) terminals. Maintain the equipment configuration and polarities shown in Figure 2.
3. Perform steps 5 through 8 of the *Outputs 1 and 2* procedure above.

4. Verify that the difference between V1 and V2 is ≤ 50 mV.
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
6. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 2 and OUTPUT 1 terminals and connect them to the rear panel OUTPUT 2 (+) and OUTPUT 1 (–) terminals. Maintain the equipment configuration and polarities shown in Figure 2.
7. Repeat steps 5 through 8 of the *Outputs 1 and 2* procedure above and verify that the difference between V1 and V2 is ≤ 50 mV.
8. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
9. Disconnect the DMM and electronic load from the instrument.

Parallel Operation. Use the following steps to check the parallel mode output accuracy.

1. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 2.
3. Set the DMM to measure 25 VDC.
4. Set up the power supply as follows:

VOLTS SET	20 V
CURRENT SET	5.1 A
OVP SET	22 V
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 5.000 A.
7. Record the DMM voltage (V1).
8. Turn off the electronic load and record the DMM voltage again (V2).
9. Verify that the difference between V1 and V2 is ≤ 6 mV.
10. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
11. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 2 terminals and connect them to the OUTPUT 2 terminals on the rear of the instrument. Maintain the equipment configuration and polarities shown in Figure 2.

12. Repeat steps 5 through 8 above and verify that the difference between V1 and V2 is ≤ 3 mV.
13. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
14. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.
15. Disconnect the DMM and electronic load from the instrument.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 3 terminals. Maintain the equipment configuration and polarities shown in Figure 2.
3. Set the DMM to measure 10 VDC.
4. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	5.1 A
OVP SET	7 V
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 5.000 A.
7. Record the DMM voltage (V1).
8. Turn off the electronic load and record the DMM voltage again (V2).
9. Verify that the difference between V1 and V2 is ≤ 6 mV.
10. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
11. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 3 terminals and connect them to rear panel OUTPUT 3 terminals. Maintain the equipment configuration and polarities shown in Figure 2.
12. Repeat steps 5 through 8 above and verify that the difference between V1 and V2 is ≤ 3 mV.
13. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
14. Disconnect the DMM and electronic load from the instrument.

Constant Voltage Source Accuracy

Complete the following procedures to verify constant voltage source accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Set up the Variac. Connect the power supply AC input to the Variac variable output. Allow 20 minutes for the power supply to warm up and stabilize.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 1 terminals. See Figure 3 for details.

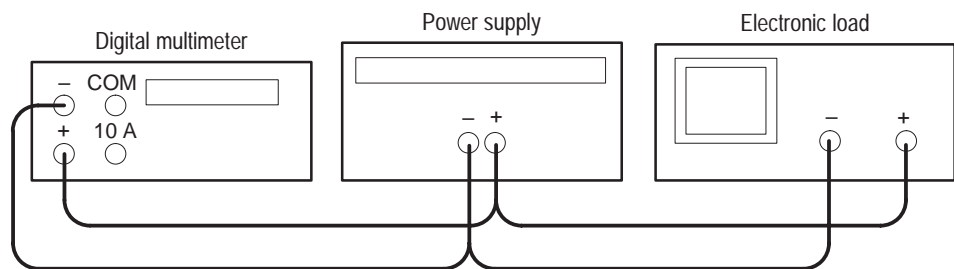


Figure 8: Constant voltage source test setup

3. Set the DMM to measure 25 VDC.
4. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
5. Set up the power supply as follows:

VOLTS SET	20 V
CURRENT SET	2.55 A
OVP SET	22 V
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 2.500 A.
8. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the DMM readout changes ≤ 0.003 volts over the adjustment range.
9. Press OUTPUT ON/OFF and disable the electronic load.
10. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.

11. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 1 terminals and connect them to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 3.
12. Repeat steps 5 through 9 above.

Series Operation. Use the following steps to check the series mode output accuracy.

1. Press SHIFT → SERIES/INDEP to configure OUTPUT 1 and OUTPUT 2 for series operation. Verify that the “SERIES” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 (+) and OUTPUT 1 (–) terminals. Maintain the equipment configuration and polarities shown in Figure 3.
3. Repeat steps 5 through 9 of the *Outputs 1 and 2* procedure above.

Parallel Operation. Use the following steps to check the parallel mode output accuracy.

1. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 3.
3. Set the DMM to measure 25 VDC.
4. Set up the power supply as follows:

VOLTS SET	20 V
CURRENT SET	5.1 A
OVP SET	22 V
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 5.000 A.
7. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the DMM readout changes ≤ 0.003 volts over the adjustment range.

8. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off; then disable the electronic load.
9. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 3 terminals. Maintain the equipment configuration and polarities shown in Figure 3.
3. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	5.1 A
OVP SET	7 V
4. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
5. Enable the electronic load. Adjust the load until the power supply CURRENT (A) readout indicates 5.000 A.
6. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the DMM readout changes ≤ 0.003 volts over the adjustment range.
7. Press OUTPUT ON/OFF; then disable the electronic load.
8. Disconnect the DMM and electronic load from the instrument.

**Constant Voltage
Ripple and Noise
Accuracy**

Complete the following procedures to verify constant voltage ripple and noise accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the oscilloscope and 27 Ω 75 W resistor to the front panel OUTPUT 1 terminals. See Figure 4 for details.

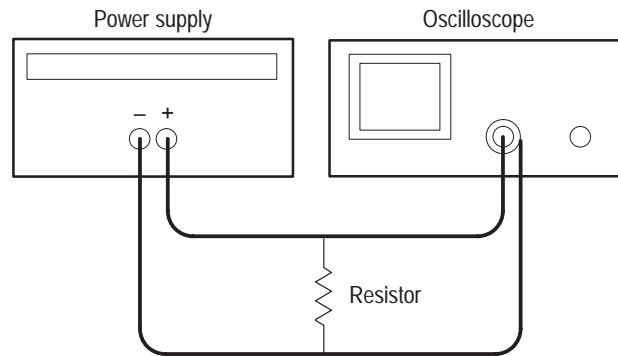


Figure 9: Constant voltage ripple and noise test setup

3. Set up the oscilloscope to measure $100 \text{ mV}_{\text{p-p}}$ (AC coupled).
4. Set up the power supply as follows:

VOLTS SET	36 V
CURRENT SET	2.55 A
OVP SET	38 V
5. Press OUTPUT ON/OFF. Verify that the “C.V.” indicator lights up on the display.
6. Using a $0.1 \mu\text{F}$ ceramic capacitor to decouple the test points, adjust the oscilloscope and verify that the noise is $\leq 30 \text{ mV}_{\text{p-p}}$.
7. Set up the oscilloscope to LINE trigger source. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the ripple changes $\leq 3 \text{ mV}_{\text{p-p}}$ over the adjustment range.
8. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
9. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
10. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 1 terminals and connect them to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 4.
11. Repeat steps 4 through 8 above.

Outputs 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.

2. Ensure that the power supply output is disabled. Connect the oscilloscope and 2.2 Ω 50 W resistor to the front panel OUTPUT 3 terminals. See Figure 4 for details.
3. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	5.1 A
OVP SET	7 V
4. Repeat steps 5 through 8 of the *Outputs 1 and 2* procedure above.
5. Remove the Variac from the test setup and repower the instrument. Allow 20 minutes for the power supply to warm-up and stabilize before the next check.

Constant Current Load and Overcurrent Protection Accuracy

Complete the following procedures to verify constant current load and overcurrent protection accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 1 terminals. See Figure 5 for details.

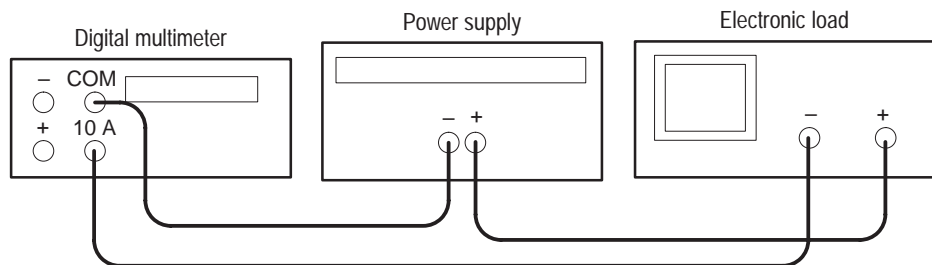


Figure 10: Constant current load test setup

3. Set the DMM to measure 5 amperes DC.
4. Set up the power supply as follows:

VOLTS SET	20 V
CURRENT SET	2.5 A
OVP SET	22 V

5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Enable the electronic load. Adjust the load until the “C.C.” indicator lights up on the power supply display.
7. Record the DMM current reading (I1).
8. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
9. Ensure that the power supply output is disabled. Remove the wire connecting the power supply OUTPUT (+) terminal to the electronic load (+) terminal.
10. Move the electronic load (–) connection to the power supply OUTPUT (+) terminal.
11. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
12. Record the DMM current reading again (I2).
13. Verify that the difference between (I1) and (I2) is ≤ 0.003 A.
14. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
15. Press OCP ON/OFF; verify that the “OCP” indicator lights up on the display.
16. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
17. Verify that the power supply readouts display the error message “Err - 012”.
18. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
19. Press OCP ON/OFF to return the power supply to normal operation. Verify that the “OCP” indicator turns off.
20. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
21. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 5.
22. Repeat steps 4 through 18 above.

Parallel Operation. Use the following steps to check the parallel mode output accuracy.

1. With the power supply set to OUT 2, press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicator lights up on the display.
2. Set the DMM to measure 10 amperes DC.
3. Set up the power supply as follows:

VOLTS SET	20 V
CURRENT SET	5.0 A
OVP SET	22 V
4. Repeat steps 5 through 14 of the *Outputs 1 and 2* procedure above but verify that the difference between (I1) and (I2) is ≤ 0.006 A.
5. Repeat steps 15 through 18 of the *Outputs 1 and 2* procedure above.
6. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and electronic load to the front panel OUTPUT 3 terminals. Maintain the equipment configuration and polarities shown in Figure 5.
3. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	5.0 A
OVP SET	7 V
4. Repeat steps 5 through 18 of the *Outputs 1 and 2* procedure above.
5. Disconnect the DMM and electronic load from the instrument.

Constant Current Source Accuracy

Complete the following procedures to verify constant current source accuracy.

Outputs 1 and 2. Use the following steps to check the OUTPUT 1 and OUTPUT 2 accuracy.

1. Set up the Variac. Connect the power supply AC input to the Variac variable output. Allow 20 minutes for the power supply to warm up and stabilize.

2. Ensure that the power supply output is disabled. Connect the DMM and $27\ \Omega$ $75\ \text{W}$ resistor to the front panel OUTPUT 1 terminals. See Figure 6 for details.

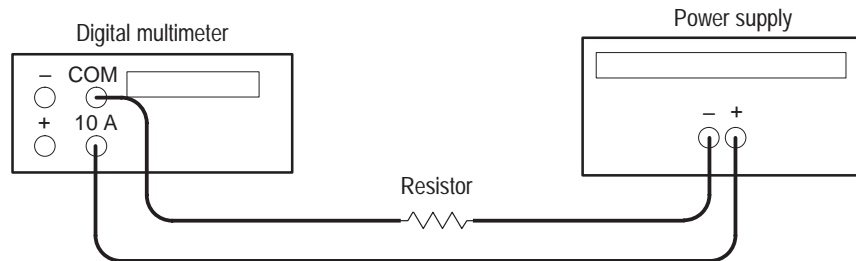


Figure 11: Constant current source test setup

3. Set the DMM to measure 5 amperes DC.
4. Press SHIFT → OUT 1; verify that the “1” indicator lights up on the display.
5. Set up the power supply as follows:

VOLTS SET	20 V
CURRENT SET	2.5 A
OVP SET	22 V
6. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
7. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the DMM current variation is $\leq 0.003\ \text{A}$ over the adjustment range.
8. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
9. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.
10. Ensure that the power supply output is disabled. Remove the leads from the front panel OUTPUT 1 terminals and connect them to the front panel OUTPUT 2 terminals. Maintain the equipment configuration and polarities shown in Figure 6.
11. Repeat steps 5 to 8 above.

Parallel Operation. Use the following steps to check the parallel mode output accuracy.

1. Press SHIFT → OUT 2; verify that the “2” indicator lights up on the display.

2. Press SHIFT → PARA/INDEP to configure OUTPUT 1 and OUTPUT 2 for parallel operation. Verify that the “PARA” indicators light up on the display.
3. Set the DMM to measure 5 amperes DC.
4. Set up the power supply as follows:

VOLTS SET	20 V
CURRENT SET	5.0 A
OVP SET	22 V
5. Press OUTPUT ON/OFF. Verify that the “OUT” indicator lights up on the display.
6. Adjust the output of the Variac from 108 to 132 VAC (120 V range) or 198 to 242 VAC (220 V range). Verify that the DMM current variation is ≤ 0.006 A over the adjustment range.
7. Press OUTPUT ON/OFF. Verify that the “OUT” indicator turns off.
8. Press SHIFT → PARA/INDEP to reconfigure the outputs for independent operation. Verify that the “PARA” indicator turns off.

Output 3. Use the following steps to check the OUTPUT 3 accuracy.

1. Press SHIFT → OUT 3; verify that the “3” indicator lights up on the display.
2. Ensure that the power supply output is disabled. Connect the DMM and 2.2Ω 50 W resistor to the front panel OUTPUT 3 terminals. See Figure 6 for details.
3. Set up the power supply as follows:

VOLTS SET	6 V
CURRENT SET	5.0 A
OVP SET	7 V
4. Repeat steps 6 through 8 of the *Outputs 1 and 2* procedure above.

This concludes the PS2521 and PS2521G performance verification procedures.

PS2520 and PS2521 Series Adjustment Procedures

This section contains procedures to adjust PS2520 and PS2521 Series power supplies. If your instrument fails a performance requirement, use these procedures to return it to factory specifications.

In this section you will find the following information:

- A list of the adjustments
- A list of test equipment needed to make the adjustments
- Instructions on how to prepare instruments for adjustment
- Step-by-step adjustment procedures

The procedures in this section do not verify performance. To confirm that your power supply meets factory specifications, implement the procedures in the *PS2520 and PS2521 Series Performance Verification* section.

List of Adjustments

Use the adjustments listed in Table 8 to return PS2520 Series power supplies to factory calibration.

Table 8: PS2520 and PS2521 series adjustments

Full Calibration
Output 1
Output 2
Parallel Output: Current Offset
Parallel Output: Current Full Scale
Output 3
Partial Calibration
Voltage Offset
Voltage Full Scale
Current Offset
Current Full Scale
Overvoltage Protection: Offset
Overvoltage Protection: Full Scale

Table 8: PS2520 and PS2521 series adjustments(cont.)

Parallel Output: Current Offset
Parallel Output: Current Full Scale

Test Equipment

To ensure accurate adjustments, use the test equipment specified in Table 9.

Alternative test equipment must meet or exceed the intended minimum requirements specified in Table 9. If you substitute equipment, you may need to modify the procedures.

NOTE. Before making any adjustment, warm up the test equipment according to the manufacturer’s recommendations.

Table 9: Adjustment test equipment

Description	Minimum requirements	Example product
Digital Multimeter	4½-digit	Tektronix DM2510 or DM25210G
	DC volts accuracy: 0.05%	
	DC ampere accuracy: 0.8%	

Preparation for Adjustment

Perform the adjustment procedures on an as-needed basis. If a power supply section fails a performance requirement, or if a section is replaced or repaired, adjust only that section. Adjusting individual sections of the instrument rarely affects its total performance.

The following guidelines apply to all adjustments:

- Verify that the line voltage selector (instrument rear) is set to the correct voltage. If you must change the selector setting, disconnect the AC power before altering the setting.
- Remove the instrument cover for the voltage full-scale calibrations only.
- Plug in and warm up the instrument for at least ten minutes. A thirty minute warm-up period is required if the instrument has been exposed to a high-humidity or high-condensing environment.

- Perform the adjustments in a 22° to 24° C (71° to 75° F) ambient environment with a relative humidity of 75% or less.
- Do not alter any setting unless a performance characteristic cannot be met at the current setting.
- Do not alter any setting without reading the entire adjustment procedure first.
- Read the *Safety Summary* at the beginning of this manual before proceeding.

Remove Instrument Cover

You must remove the instrument cover to make internal adjustments.



WARNING. To avoid electrical shock, disconnect the power cord from its source before removing the instrument cover. Following the adjustment procedure, replace the instrument cover before using the power supply.

To remove the instrument cover, refer to Figure 12 while performing the following steps.

1. Remove the two handle mounting screws with a Phillips-head screwdriver.
2. Remove the six side panel mounting screws.
3. Slide the cover toward the rear of the instrument and lift.

To reinstall the cover, perform steps 1 through 3 above in reverse order.

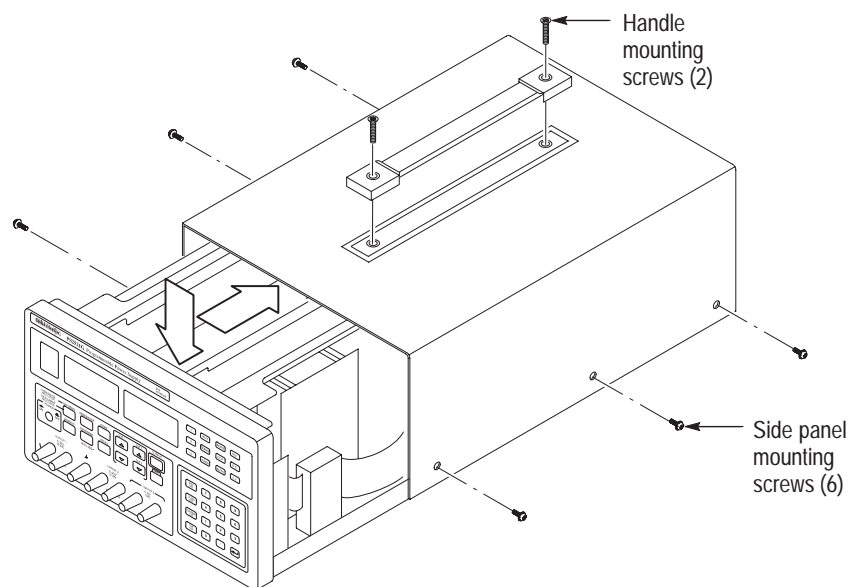


Figure 12: PS2520 series instrument cover removal

Adjustment Procedure

To calibrate PS2520 series power supplies, you must create voltage and current constants and store them in nonvolatile RAM. Each set of constants consist of an offset and full-scale value.

You can perform either partial or full calibrations. To perform a full calibration, the power supply follows a preset procedure that allows you to set the voltage, current, and overvoltage protection values. You can also make individual calibrations as identified in Table 10. Each calibration procedure is identified by a display code.

Table 10: Calibration display codes

Display code	Calibration description
cL00	Password accepted (initiate calibration)
cL10	Voltage offset
cL11	Voltage full scale
cL20	Current offset
cL21	Current full scale
cL2F	Current offset or current full-scale calibration complete
cL30	Overvoltage protection offset
cL31	Overvoltage protection full scale
cL40	Parallel output: current offset
cL41	Parallel output: current full scale

NOTE. *If the calibration procedure detects an error, the readout will display an error code. See your User manual for a list of error code descriptions.*

Full Calibration

To perform a full calibration, perform the following procedures in sequential order.

Output 1. Use the following steps to calibrate OUTPUT 1.

1. Press (SHIFT) OUT 1; verify that the “1” indicator lights up on the display.
2. Press (SHIFT) CURRENT ▾.

3. Enter the calibration password on the keypad:
 - PS2520 & PS2520G: enter **2520** (←)
 - PS2521 & PS2521G: enter **2521** (←)
4. Verify that the power supply readout displays **cL00**, indicating calibration mode.
5. Configure the DMM to measure DC volts autorange.
6. Connect the DMM positive and negative leads to the corresponding front panel OUTPUT 1 (+) and (–) terminals.
7. Press (←) on the power supply keypad. Verify that the power supply readout displays **cL10**, indicating voltage offset calibration.
8. Enter the DMM reading on the power supply keypad and press (←).
9. Verify that the power supply readout displays **cL11**, indicating voltage full-scale calibration.
10. Adjust VR501 and VR601 to the settings listed in Table 11. (See Figure 13 for the adjustment locations.) Following the adjustment, enter the DMM reading on the power supply keypad and press (←).

Table 11: Voltage full-scale adjustment (full calibration)

Instrument model	To cal. OUTPUT 1	To cal. OUTPUT 2
PS2520/PS2520G	Adjust VR601 for a DMM reading of 37.00 V	Adjust VR501 for a DMM reading of 37.00 V
PS2521/PS2521G	Adjust VR601 for a DMM reading of 21.00 V	Adjust VR601 for a DMM reading of 21.00 V

11. Verify that the power supply readout displays **cL20**, indicating current offset calibration.
12. Configure the DMM to measure 2 amperes DC.

NOTE. For proper current calibration, use quality test leads with good low temperature thermal characteristics. Also ensure that good connections exist between the DMM and the Power Supply.

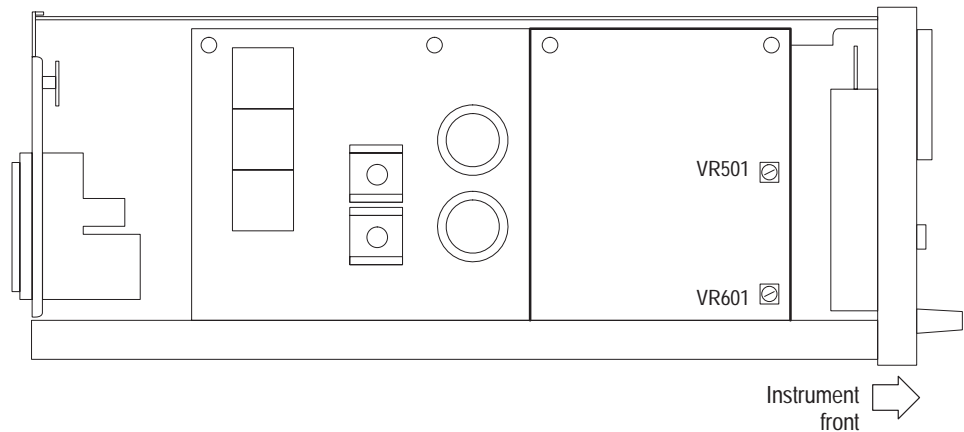


Figure 13: VR501, VR601 adjustment location

13. Enter the DMM reading on the keypad (in amperes); then press (←). Verify that the power supply readout displays **cL2F**, indicating that the current offset calibration is complete.
14. Set the DMM to the 10 A range and press (←) on the power supply. Verify that the power supply readout displays **cL21**, indicating current full-scale calibration.
15. Enter the DMM reading on the power supply keypad and press (←). Verify that the power supply readout displays **cL2F**, indicating that the current full-scale calibration is complete.
16. Disconnect the DMM from the power supply.
17. Press (←) on the power supply and verify that the readout displays **cL30**, indicating overvoltage protection offset calibration. Wait 10 seconds and verify that the readout displays **cL31**, indicating that the overvoltage protection full-scale calibration is running.
18. Wait another 10 seconds for the readout to return to normal. The calibration is complete.

Output 2. Use the following steps to calibrate OUTPUT 2.

1. Press (SHIFT) OUT 2; verify that the “2” indicator lights up on the display.
2. Perform steps 2 through 5 of the *Output 1* procedure above.
3. Connect the DMM positive and negative leads to the corresponding front panel OUTPUT 2 (+) and (–) terminals.
4. Perform steps 7 through 18 of the *Output 1* procedure above.

Parallel Output: Current Offset. Use the following steps to calibrate the parallel output offset current.

1. Press (SHIFT) OUT 2; verify that the “2” indicator lights up on the display.
2. Press (SHIFT) CURRENT ▾.
3. Enter the calibration password on the keypad:
PS2520 & PS2520G: enter **2520** (←↵)
PS2521 & PS2521G: enter **2521** (←↵)
4. Verify that the power supply readout displays **cL00**, indicating calibration mode.
5. Configure the DMM to measure 2 amperes DC.
6. Enter **4** on the power supply keypad and press (←↵). Verify that the “PARA” indicator lights up on the display and the readout displays **cL40**, indicating parallel output current offset calibration.
7. Enter the DMM reading on the power supply keypad and press (←↵). The power supply readout will return to normal in approximately 10 seconds. The calibration is complete.

Parallel Output: Current Full Scale. Use the following steps to calibrate the parallel output full-scale current.

1. Press (SHIFT) OUT 2; verify that the “2” indicator lights up on the display.
2. Press (SHIFT) CURRENT ▾.
3. Enter the calibration password on the keypad:
PS2520 & PS2520G: enter **2520** (←↵)
PS2521 & PS2521G: enter **2521** (←↵)
4. Verify that the power supply readout displays **cL00**, indicating calibration mode.
5. Configure the DMM to measure 10 amperes DC.
6. Enter **4** on the power supply keypad.
7. Press VOLTS △ to select the parallel output full-scale current calibration; verify that the the readout displays **cL41**, indicating parallel output full-scale calibration.
8. Press (←↵) on the power supply. Verify that the “PARA” indicator lights up on the display.

9. Enter the DMM reading on the power supply keypad and press (←). The power supply readout will return to normal in approximately 5 seconds. The calibration is complete.

Output 3. Use the following steps to calibrate OUTPUT 3.

1. Press (SHIFT) OUT 3; verify that the “3” indicator lights up on the display.
2. Press (SHIFT) CURRENT ▾.
3. Enter the calibration password on the keypad:
 - PS2520 & PS2520G: enter **2520** (←)
 - PS2521 & PS2521G: enter **2521** (←)
4. Verify that the power supply readout displays **cL00**, indicating calibration mode.
5. Configure the DMM to measure DC volts autorange.
6. Connect the DMM positive and negative leads to the corresponding OUTPUT 3 (+) and (–) terminals.
7. Press (←) on the power supply keypad. Verify that the power supply readout displays **cL10** (voltage offset calibration).
8. Enter the DMM reading on the power supply keypad and press (←).
9. Verify that the power supply readout displays **cL11**, indicating voltage full-scale calibration.
10. Adjust VR401 for a DMM reading of 6.5 V. See Figure 14 for the adjustment location.

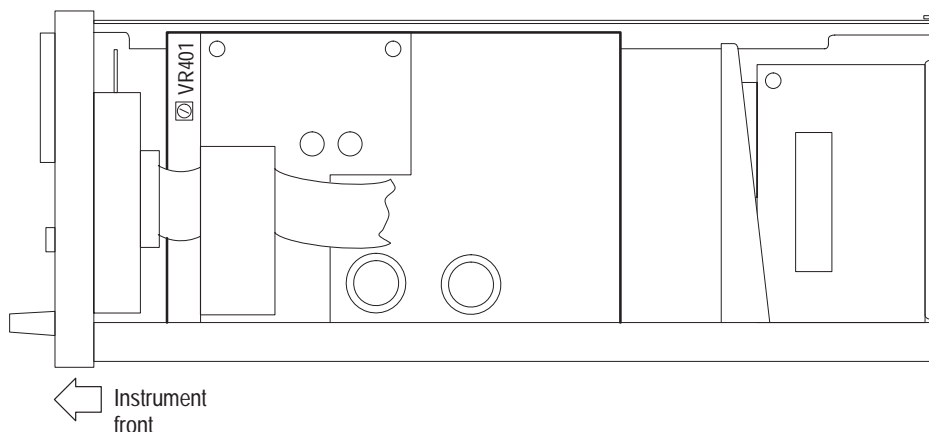


Figure 14: VR401 adjustment location

11. Enter the DMM reading on the power supply keypad and press (←↵).
12. Verify that the power supply readout displays **cL20**, indicating current offset calibration.
13. Configure the DMM to measure 2 amperes DC.
14. Enter the DMM reading on the power supply keypad and press (←↵). Verify that the power supply readout displays **cL2F**, indicating that the current offset calibration is complete.
15. Set the DMM to the 10 A range and press (←↵) on the power supply. Verify that the power supply readout displays **cL21** indicating current full-scale calibration.
16. Enter the DMM reading on the power supply keypad and press (←↵). Verify that the power supply readout displays **cL2F**, indicating that the current full-scale calibration is complete.
17. Disconnect the DMM from the power supply.
18. Press (←↵) on the power supply and verify that the readout displays **cL30**, indicating overvoltage protection offset calibration.
19. Wait 10 seconds and verify that the readout displays **cL31**, indicating that the overvoltage protection full-scale calibration is running. Wait another 10 seconds for the readout to return to normal. The calibration is complete.

Partial Calibration

See Table 10 for a list of partial calibrations; then proceed with the following steps.

NOTE. Do not remove the instrument cover unless you intend to perform a voltage full-scale calibration.

1. Select the power supply output to calibrate: press (SHIFT) <OUT 1, OUT 2, or OUT 3>. For a Parallel Output calibration, select OUT 2.
2. Press (SHIFT) CURRENT ▾.
3. Enter a calibration password on the keypad:
 - PS2520 & PS2520G: enter **2520** (←↵)
 - PS2521 & PS2521G: enter **2521** (←↵)
4. Verify that the power supply readout displays **cL00**, indicating calibration mode.
5. Configure the DMM function and range as outlined in table 12.

Table 12: Set DMM function and range

Calibration type	DMM function	DMM range
All voltage calibrations	DC Volts	Autorange
Current offset	DC Amperes	2 A
Current full scale	DC Amperes	10 A

6. Connect the DMM to the power supply as outlined in table 13.

Table 13: DMM to power supply connections

Calibration type	Display code	Connection instructions
Voltage	cL10, cL11	Connect DMM positive and negative leads to the corresponding power supply (+) and (-) OUTPUT terminals.
Current	cL20, cL21	Connect DMM positive and negative leads to the corresponding power supply (+) and (-) OUTPUT terminals.
Overvoltage Protection	cL30, cL31	No connection from DMM to power supply.
Parallel Output Current	cL40, cL41	Connect DMM positive and negative leads to the corresponding power supply (+) and (-) OUTPUT terminals.

NOTE. The DMM range and function must be properly selected before proceeding to the next step. Ensure that good connections exist between the DMM and the power supply.

7. Enter the calibration mode on the keypad:
- Press **1** for voltage calibrations.
 - Press **2** for current calibrations.
 - Press **3** for overvoltage protection calibrations.
 - Press **4** for parallel output calibrations.
8. Press VOLTS \triangle for offset calibration, or press VOLTS ∇ for full-scale calibration.
9. Verify that the readout displays the correct code for the desired calibration. See Table 10.
10. Press (\leftarrow) on the power supply keypad to initiate the calibration. Refer to the instructions below to complete each calibration.

cL10 Voltage Offset Calibration. To calibrate the voltage offset, enter the DMM reading on the power supply keypad and press (←). The readout will return to normal when the calibration is complete.

cL11 Voltage Full Scale Calibration. To calibrate the full-scale voltage, adjust VR601, VR501, or VR401 using the instructions in Table 14. Refer to Figures 13 and 14 for the adjustment locations.

Enter the DMM reading on the power supply keypad and press (←). The readout will return to normal when the calibration is complete.

Table 14: Voltage full-scale adjustment (partial calibration)

Instrument model	To cal. OUTPUT 1	To cal. OUTPUT 2	To cal. OUTPUT 3
PS2520/PS2520G	Adjust VR601 for a DMM reading of 37.00 V	Adjust VR501 for a DMM reading of 37.00 V	Adjust VR401 for a DMM reading of 6.5 V
PS2521/PS2521G	Adjust VR601 for a DMM reading of 21.00 V	Adjust VR601 for a DMM reading of 21.00 V	Adjust VR601 for a DMM reading of 6.5 V

cL20 Current Offset Calibration. To calibrate the current offset, enter the DMM reading (in amperes) on the power supply keypad and press (←). The readout will return to normal when the calibration is complete.

cL21 Current Full Scale Calibration. To calibrate the full-scale current, enter the DMM reading on the power supply keypad and press (←). The readout will return to normal when the calibration is complete.

cL30 Overvoltage Protection: Offset Calibration. Wait 10 seconds for the calibration to complete.

cL31 Overvoltage Protection: Full Scale Calibration. Wait 10 seconds for the calibration to complete.

cL40 Parallel Output: Current Offset Calibration. To calibrate the parallel output current offset, perform the following steps.

1. Verify that the “PARA” indicator lights up on the display.
2. Enter the DMM current reading on the power supply keypad and press (←).

The readout will return to normal when the calibration is complete.

cL41 Parallel Output: Current Full Scale Calibration. To calibrate the parallel output full-scale current, perform the following steps.

1. Verify that the “PARA” indicator lights up on the display.
2. Enter the DMM current reading on the power supply keypad and press (←→).

The readout will return to normal when the calibration is complete.