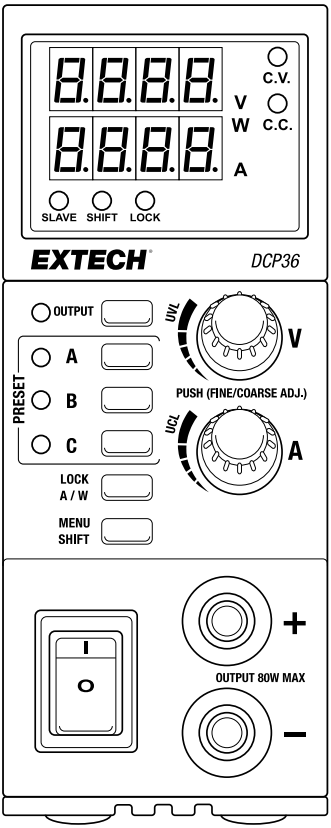
EXTECH®

USER MANUAL

Model DCP36

80W Switching DC Power Supply



User Manual Translations available at www.extech.com

Introduction

Thank you for selecting the Extech DCP36 laboratory grade 80W Switching DC Power Supply. The DCP36 is auto-ranging and offers a 0.5~36V and 0~5A output capability. Its maximum current output at 36V is 2.2A (80W/36V). The maximum voltage output at 5A is 16V (80W/5A).

The voltage/current spectrum is greater than three conventional power supplies of the same power rating. Adjustable Upper Voltage/Current Limit features protect sensitive devices from wide output variations. Three user presets allow for easy programming and recall of commonly used output configurations. Master/Slave capability for up to 30 units in parallel connection. The DCP36 is perfect for benchwork, field service, and hobbyists.

The DCP36 is shipped with the following accessories: AC power cord, RJ11 cable, alligator clip test leads, and an RJ11 terminator plug.

This power supply is shipped fully tested and calibrated and, with proper use, will provide years of reliable service. Please visit the Extech website for the latest user manual and for customer support.

Safety

This manual contains important information illustrating the safe and proper use of this power supply. Read the entire manual and carefully observe the markings and labels on this unit and on the equipment to which it will be connected.

*Failure to observe **Warnings** may cause injury to persons and damage to the power supply or the connected equipment. Failure to observe **Caution** statements may result in damage to connected equipment and improper functioning of the power supply.*

WARNINGS

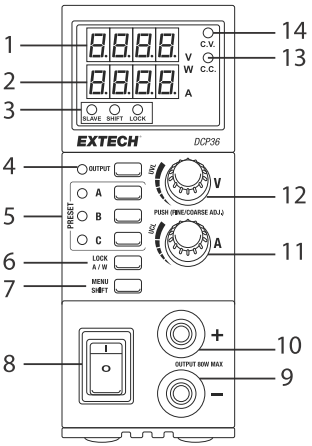
1. Do not use this power supply near water.
2. Do not operate or touch this power supply with wet hands.
3. Do not open the casing of the power supply when it is connected to AC mains.
4. Refer all servicing, including fuse replacement, to qualified service personnel.

CAUTIONS

1. Use a grounded 3-terminal AC source.
2. This unit is intended for indoor use only.
3. Do not operate or place this unit in a humid or dusty environment.
4. Do not expose this device to direct sunlight or place it near a source of heat.
5. Before plugging into the local AC mains, check the rating label at the back of the unit.
6. Do not block any of the ventilation openings on the unit.
7. This unit must be used within the specified ratings; Continuous and excessive loading may cause damage to the power supply.
8. The gauge size of input power cable must be at least 0.75mm^2 (18awg) and the total length of power cable must not exceed 3m (10ft).

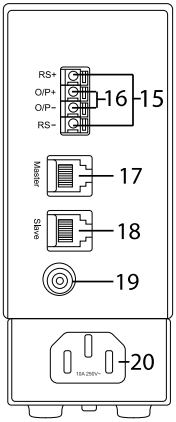
Power Supply Description

Front and Back Descriptions



1. Output Voltage Display
2. Output Current or Power Display
3. SLAVE-SHIFT-LOCK function indicators
4. Output ON-OFF button and indicator
5. Output preset selection buttons and indicators
6. LOCK and Amp/Watt-meter button
7. MENU and SHIFT button
8. Power ON-OFF switch
9. Output terminal (negative)
10. Output terminal (positive)
11. Current output adjustment
12. Voltage output adjustment
13. Constant Current indicator
14. Constant Voltage indicator
15. Remote Sensing (RS) terminals
16. Alternate output (O/P) terminals
17. Master RJ11 jack
18. Slave RJ11 jack
19. Earth Ground terminal
20. AC power jack

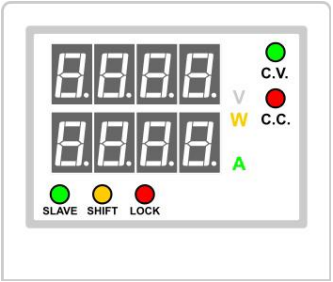
Note that there is an additional RJ11 jack on the back of the unit labeled 'Reserved' that is unused in this model



Display Descriptions

Constant Voltage mode (C.V. indicator)

The output voltage is kept constant at the set voltage. The DCP36 remains in CV mode if the load current is lower than the set current limit, otherwise it will switch to CC mode.



Constant Current mode (C.C. indicator)

When the load is higher than the set current limit of the set voltage in CV mode, the Constant Current mode is active. The output current is kept constant at the set current level provided that the loading is sufficiently large to draw current equal to or larger than the set current, otherwise it will switch to the CV mode.

Watt-meter (W indicator)

Lower 4-digit LED row is active as a watt-meter. The value is showing output power in Watts.

Amp-meter (A indicator)

Lower 4-digit LED row is active as an amp-meter. The value is showing output in Amperes.

SLAVE indicator (green)

The DCP36 is in the slave mode and controlled by a master unit. The voltage and current setting of slave units are controlled by the master unit. The buttons and knobs of slave units are locked.

SHIFT indicator (yellow)

Indicates that the SHIFT key is pressed and that the secondary function of a button or knob will be activated. Short press SHIFT to activate the setting mode for UVL, UCL, or A/W functions.

LOCK indicator (red)

Indicates that the power supply panel is locked.

Output indicator (next to Output button)

Indicates output power ON / OFF status.

Preset A, B, C indicators

Indicates that output preset A, B, or C is selected and that the output voltage and current corresponds to the pre-programmed preset A, B, or C settings.

Button Descriptions

Note: The secondary functions for buttons/knobs can only be activated by first pressing **SHIFT** so that the SHIFT LED is lit. Secondary functions cannot be selected if the SHIFT LED is not lit.

Voltage adjust knob: Turn clockwise or counterclockwise to increase/decrease the voltage output. Press knob to adjust individual digits, selected digit will be highlighted.

Current adjust knob: Turn clockwise or counterclockwise to increase/decrease the current output. Press knob to adjust individual digits, selected digit will be highlighted.

Output button: Press to switch the DCP36 output ON (the corresponding LED will be lit). Press to switch OFF the power supply output (LED will switch OFF).

Preset A, B, C buttons: Press to choose a pre-programmed current/voltage output configuration. The corresponding LED will switch ON.

LOCK A/W button: Short press to Lock/Unlock the front panel. When SHIFT is pressed first, this button toggles the Ampere (A) meter / Watt (W) meter on the lower 4-digit LED readout.

Menu / Shift button: Long press to access the programming menu. Short press to access secondary functions for the Lock A/W button (amp or watt-meter), UVL setting (upper voltage limit), and UCL setting (upper current limit). For UVL/UCL adjustments use the Voltage/Current knobs.

Programming Menu

Power Supply Address ID (for use with Master/Slave setup)

1. Long press **MENU** to enter the settings menu
2. Turn the Voltage knob until you see **'Add' 'SEt'** (address setting)
3. Press the Voltage knob to enter the address menu
4. Turn the Current knob to change the address ID (0~30). The Master unit must be set = 0. Each Slave unit must have a unique ID (1 ~30).
5. Press the Voltage knob to confirm
6. Press **MENU** to exit

Factory Default Reset

1. Long press **MENU** to enter the settings menu
2. Turn the Voltage knob until you see **'FACS' 'SEt'** (factory setting)
3. Press the Voltage knob to enter the address menu
4. Turn the Current knob to select **no** or **yes**
5. Press the Voltage knob to confirm selection
6. Press **MENU** to exit

Upper Voltage/Current (UVL/UCL) Limits

The Upper Voltage (UVL) and Current (UCL) Limits are added protection for sensitive loads. When the output exceeds the UVL or UCL setting, the output signals will automatically switch OFF and the alert icon '**Uul'** or '**UCl**' will appear. The second function of the Voltage and Current Knobs are for UVL and UCL adjustment.

1. Press **SHIFT** and the SHIFT LED will switch ON.
2. Press the Voltage or Current knob. The display will show '**SUul'** or '**SUCl**' and the UVL or UCL value on the 4-digit LEDs.
3. Turn the Voltage or Current knob to adjust the **UVL** or **UCL** value. Press the Voltage or Current knob to select a digit for editing.
4. Press **SHIFT** to confirm the setting and to exit the mode. If the new value is lower than the output setting, the DCP36 will display an error (**Erro**). In this case, reduce the output setting to a value lower than the UVL or UCL value.

Stand-Alone Operation

1. With no load attached to either the front or rear output terminals, plug the power supply into an AC power source.
2. Use the **POWER** button to switch the power supply ON.
3. The firmware version will briefly appear and then the 4-digit LEDs will read zero.
4. When connected to a load, the Voltage and Current knobs can be turned clockwise or counterclockwise to increase or decrease the output levels for the selected preset A, B, or C (see next section). View the adjustments on the 4-digit LED readouts. You can also short

press the Voltage or Current knob to select individual digits to adjust; the selected digit will appear bold. Rotate the knob to set the digit and then press the knob to select another digit.

5. Use the **OUTPUT** button to turn the output OFF.

   Note: The front and rear output terminals are connected internally.

Output Presets (*A, B, and C*)

The DCP36 offers three Voltage/Current output preset configurations (A, B, and C) for quick recall. Select a preset by pressing the A, B, or C button, the corresponding preset LED will light. To adjust a preset configuration, first press the A, B, or C button and then use the Voltage and Current knobs to set the desired output levels. The new settings will be saved automatically. The values can be reset to factory default in program menu. Note that the output will automatically switch OFF when another preset is selected in order to prevent damage to a connected load if a preset output is set too high.

Front Panel Lock-out

To lock the front panel controls, short press the **LOCK** button. The LOCK LED indicator is lit when the front panel is locked. To unlock the front panel, press the **LOCK** button again, the LOCK LED will switch OFF. When the front panel is locked only the **LOCK** button is functional.

Watt-meter / Amp-meter selection

The lower 4-digit LED readout is used to display current (Amperes) or Power (Watts). To switch between the two types:

1. Press **SHIFT**; the SHIFT LED will switch ON
2. Press the **A/W** button to switch to Watt-meter
3. Press **SHIFT**; the SHIFT LED will switch ON
4. Press **A/W** to revert to the Amp-meter mode

Remote Sensing

When the output current is high or the load connection cable is very long, a voltage drop develops across the connecting cables. This results in a difference between the voltage at the output terminals and at the load point. By connecting the Remote Sense terminals to the load point, the voltage reading at the output display and the voltage at the load point will be the same.

Caution: Observe correct polarity and never short the Remote Sensing terminals.

1. Connect the power supply output terminals to the Load (use the front or rear O/P terminals)
2. Connect the Remote Sensing terminals to the Load (push in on the orange tabs on the terminal block to open the wire clamp inside the connector)
3. Connect RS+ to the Positive (+) connection at the Load
4. Connect RS- to the Negative (-) connection at the Load

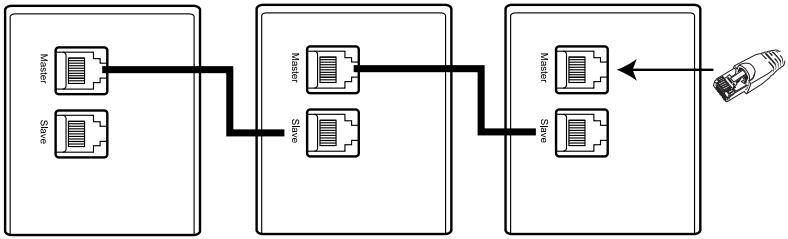
Note: Always disconnect the Remote Sense terminal connections **before** disconnecting the Load connections.

Master/Slave Operation

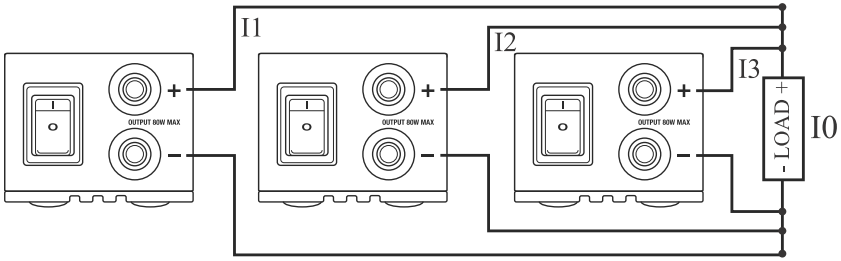
Two or more units (up to 30) can be connected in parallel to increase output current to the sum of the connected supplies. In this mode of operation, the Master power supply will control all the voltage and current settings of the Slave units.

Note: Please follow these steps carefully and in the correct order. Failure to do so can result in a lockout condition. If this occurs, please power off all units, disconnect the wiring, and begin again.

1. Set all the power supplies to the same upper voltage limit (UVL) and voltage/current range.
2. Set the voltage and current output of all the slaves to maximum values.
3. Switch off all the power supplies.
4. Connect the back of the power supplies as shown in the diagram below. **Note:** For proper operation all connecting cables and output cables should be of the same gauge and length. Be sure to connect a terminator to the last Slave unit's Master jack.



5. Using either the output terminals on the front or back, connect the output cables in parallel to the load as shown in diagram below.
6. Program the Master unit's Address ID to '0' (factory default) and set each Slave to a unique ID between 1 and 30. See the Programming Menu section for details.
7. Switch ON the Master first and set the desired output, then switch ON the Slave units. Each Slave unit's LED indicator should be lit if the wiring is configured correctly.
8. All output voltages and currents are now controlled by the Master unit.



$$I0 = I1 + I2 + I3$$

Specifications

Input Power	100 ~ 240VAC (50 to 60Hz), 1.2A US (NEMA 5-15P to IEC-C13) power cable supplied Optional EU or UK cables available
Supply voltage fluctuation	± 10% of stated operating voltage
Efficiency	≥ 78%
Power Factor	> 0.9
No load input current at 230V	≤ 150mA
Full load input current at 230V	≤ 500mA
Output voltage accuracy	± (1.0% reading + 15 digits)
Output current accuracy	± (1.0% reading + 15 digits)
Voltage Output, DC	Auto ranging 36V max. (maximum voltage output at 5A is 16V)
Current Output, DC	5A max. (maximum current output at 36V is 2.2A)
Constant voltage and current ranges	0.5 ~ 36V / 5A (auto range with 80W max. power)

Constant Voltage characteristics:

Adjustment resolution	10mV
Ripple and Noise	≤ 35mVp-p
Line Regulation (±10%)	≤ 4mV
Load Regulation (10~90%)	≤ 30mV

Constant Current characteristics:

Adjustment resolution	10mA
Line Regulation (±10%)	≤ 10mA
Load Regulation (10~90%)	≤ 10mA

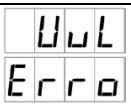
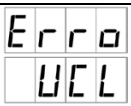
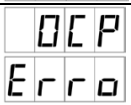
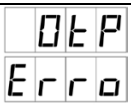
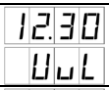
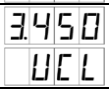
Metering accuracy:

Display	Dual 4-digit LED
Voltage meter accuracy	± (0.5% reading + 5 digits)
Current/watt meter accuracy	± (0.5% reading + 5 digits)

User adjustable upper voltage/current limits	Yes
Remote Sensing	Yes
Protection	Over-voltage protection, Current Limiting protection, Short Circuit, Overload, Over-temperature, Upper voltage limit, Upper Current Limit
Operating %RH	10 to 80% RH
Altitude	2000m
Pollution degree	2
Installation Category	CAT II
Master/Slave control	YES (to max. of 30 units)
Cooling method	Convection
Dimensions	330 x 127 x 53.5mm (13 x 5 x 2") Depth x Height x Width
Weight	1.9 kg (4.2lbs.)

Specifications are subject to change and based on an operating temperature of 25°C and Pressure of 0.1Mpa

Troubleshooting

ERROR	DESCRIPTION	RESOLUTION
	UVL (Upper Voltage Limit) setting error UVL setting < output current set value.	Solution 1: Rotate Volt knob clockwise. Both UVL and output will be set to new UVL value Solution 2: Cycle power supply power
	UCL (Upper Current Limit) setting error UCL setting is < output current set value.	Solution 1: Rotate Volt knob clockwise. Both UCL and output will be set to new UCL value Solution 2: Cycle power supply power
	OuP (Output Over Voltage Protection error) Detected voltage at output terminal is > the voltage setting	Step 1: Switch off power supply Step 2: Disconnect load Step 3: Switch on power supply (If this error persists, contact Extech)
	Output Over Current Protection error Detected output current > the current setting	Step 1: Switch off power supply Step 2: Disconnect load Step 3: Switch on power supply (If this error persists, contact Extech)
	System Over-Temperature Protection error Power supply internal temperature is too high	Step 1: Switch off power supply Step 2: Disconnect load Step 3: Allow a 30-minute cool down Step 4: Switch on power supply (If this error persists, contact Extech)
WARNING	**NOTES**	
	Do not increase the voltage output setting higher than the Upper Voltage Limit. Reset and increase the Upper Voltage Limit or decrease the output voltage setting.	
	Do not increase the current setting higher than the Upper Current Limit. Reset and increase the Upper Current Limit or decrease the output current setting.	

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