

nanoPAC



nanoPAC Series Power Supplies

Instruction Manual

Catalogue Numbers

NANOPAC300P

NANOPAC500

Record the following for your records:

Model _____

Catalogue No. _____

Date of Delivery _____

Warranty Period _____

Serial No. _____

Invoice No. _____

Purchase Order No. _____

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Safety Information

Cleaver Scientific nanoPAC Power Supply has been tested and found to comply with the limits for the CE regulation. Also, it is RoHS compliant to deliver confident product which meets the environmental directive. These limits are designed to provide reasonable protection against harmful interference when the instrument series is operated in a commercial environment. This instrument series used together with power supply unit generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this instrument series in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. It is strongly recommended for the user to read the following points carefully before operating this equipment.

1. Read and follow the manual instructions carefully.
2. Do not alter the equipment. Failure to follow these directions could result in personal and/or laboratory hazards, as well as invalidate equipment warranty.
3. Use a properly grounded electrical outlet with correct voltage and current handling capacity.
4. Disconnect from power supply before maintenance and servicing. Refer servicing to qualified personnel.
5. Never use this instrument series without having the safety cover correctly in position.
6. Do not use the unit if there is any sign of damage to the external tank or cover. Replace damaged parts.
7. Do not use in the presence of flammable or combustible material; fire or explosion may result. This device contains components which may ignite such materials.
8. Refer maintenance and servicing to qualified personnel.
9. Ensure that the system is connected to electrical service according to local and national electrical codes. Failure to make a proper connection may create fire or shock hazard.
10. Use appropriate materials and operate correctly to avoid possible hazards of explosion, implosion or release of toxic or flammable gases arising from overheated materials.
11. The unit shall be operated only by qualified personnel.

Precautions

Take all necessary precautions for using any electrical device. Before connecting the electrical supply, check to see if the supply voltage is within the range stated at the rating label, and see to it that the device be seated firmly. Place the unit in a safe and dry location; it must NOT touch the surrounding. Follow the safety precautions for chemicals / dangerous materials. If needed, please contact a qualified service representative or support@cleaverscientific.com

Environmental Conditions

Ensure the instrument is installed and operated strictly under the following conditions:

1. Indoor use only
2. $\leq 95\%$ RH
3. 75 kPa – 106 kPa
4. Altitude must not exceed 2000 meters
5. 4°C~ 40°C operating temperature
6. Pollution degree: 2
7. Mains supply voltage fluctuations up to $\pm 10\%$ of the normal voltage

Avoiding Electrical Shock

Follow the guidelines below to ensure safe operation of the unit.

The nanoPAC Power Supply has been designed to utilize shielded wires thus minimizing any potential shock hazard to the user. Cleaver Scientific recommends against the use of unshielded wires.

To avoid electrical shock:

1. In the event of solution spilling on the instrument, it must be dried out for at least 2 hours and restored to NORMAL CONDITION before each operation.
2. Never connect or disconnect wires loading from the power jacks when the red indicator light of power switch is on.
3. WAIT at least 5 seconds after stopping a run before handling output leads or any connected apparatus.
4. ALWAYS make sure that your hands, work area, and instruments are **clean** and **dry** before making any connections or operating the power supply.
5. ONLY connect the power cord to a properly grounded AC outlet.

Avoiding Damage to the Instrument

1. Do not attempt to operate the device if damage is suspected.
2. Protect this unit from physical damage, corrosive agents and extreme temperatures (direct sunlight, etc.).

3. For proper ventilation and safety concerns, keep at least 10 cm of space behind the instrument, and at least 5 cm of space on each side.
4. Use high level of precaution against the damages on the unit.
5. Do not operate the unit out of environmental conditions addressed above.
6. Do not operate the power supplies in high humidity environments (> 95%), or where condensation may occur.
7. To avoid condensation after operating the power supply in a cold room, wrap the unit in a plastic bag and allow at least 2 hours for the unit to equilibrate to room temperature before removing the bag and operating the unit.
8. Prior to applying any cleaning or decontamination methods other than manufacturer's recommendation, users should check with the manufacturer's instruction to see if the proposed method will damage the equipment.

Equipment Operation

Follow the guidelines below to ensure safe operation of the unit:

1. NEVER access dangerous chemicals or other materials to prevent possible hazard of explosion and damage.
2. Do not operate the unit without lids or covers to prevent possible hazards.
3. A temporary conductivity caused by condensation might occur even though this series is rated Pollution Degree 2 in accordance with IEC 664.

Symbols

Symbols used on the power supply are explained below.



Indicates an area where a potential shock hazard may exist.

Consult the manual to avoid possible personal injury or instrument damage.



Indicates disposal instruction.

DO NOT throw this unit into a municipal trash bin when this unit has reached the end of its lifetime. To ensure

utmost protection of the global environment and minimize pollution, please recycle this unit.



Caution/ Warning: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

nanoPAC 300	
	Max. voltage: 300 V Max. current: 400 mA Max. watt: 60 W
nanoPAC 500	
	Max. voltage: 500 V Max. current: 400 mA Max. watt: 120 W

Potential Risk and Preventive Measures

Risk assessment table

Frequency	Frequent	Likely	Possible	Rare	Unlikely
Risk					
Bruise			√		
Slash					√
Electrical shock			√		
Power cord plug wrong				√	

Preventative measures

Potential Risk	Preventive measures
Bruise	Do not put the machine near the table edge.
Slash	Prevent hard impact on the case.
Electrical Shock	Make sure that your hands, work area, and devices are clean and dry
Power cord plug wrong	Observe correct adapter plug.

Packing List

nanoPAC 300

- 1x nanoPAC 300 Power Supply
- 1x Power Cord
- 1x Instruction Manual

nanoPAC 500

- 1x nanoPAC 500 Power Supply
- 1x Power Cord
- 1x Instruction Manual

Packing List Checked by: _____

Date: _____

The packing lists should be referred to as soon as the units are received to ensure that all components have been included. The unit should be checked for damage when received.

Cleaver Scientific is liable for all missing or damaged parts / accessories within 7 days after customer received this instrument package. Please contact Cleaver Scientific immediately regarding this issue. If no response within such period from consignee party, that will be consignee party's whole responsibility.

Please contact your supplier if there are any problems or missing items.

Specifications

Parameter	nanoPAC 300	nanoPAC 500
Output Voltage / Inc.	10-300V, 1V	10-500V, 1V
Output Current / Inc.	Step 1: 1-400 mA/ 1mA	
Max. Watt	60W	120W
Output Type	Constant Voltage or Constant Current	
Control	Microprocessor controller	
Terminal Pairs	2 Pairs	
Timer	1 - 999 minutes with alarm, continuous	
Safety Device	No load detection; shrouded plugs and sockets	
Operation Temperature	4°C~ 40°C	
Unit Dimension	140 x 191 x 84 mm (W x L x H)	
Construction material	Polycarbonate housing and aluminum bottom plates	
Weight	Approx. 1 kg	
Rated Voltage	100-240V~, 50-60Hz, 2.5A	
Program	2-step Program	
Certification	ETL, CE, FCC	

Combining small size and versatility, the newly redesigned NANOPAC power supply is an ideal choice for any researcher. Capable of providing constant current or constant voltage in 1 mA or 1 V steps, the unit is perfectly suited to run both vertical polyacrylamide and horizontal agarose electrophoresis experiments. Continuous or timed operations are easily performed using the simple and user-friendly interface. The NANOPAC features 2 electrode pairs, allowing for 2 gels to be run simultaneously, saving both time and valuable bench space. With a universal voltage rating, the NANOPAC is also designed and constructed to the most rigorous safety standards. Packages including single or dual horizontal electrophoresis systems are excellent choices for educational or personal use.

Features of nanoPAC Series Power Supply:

- Compact size
- Constant Voltage or Constant Current operation
- 1 V step voltage selection; 1 mA step current selection
- Timer

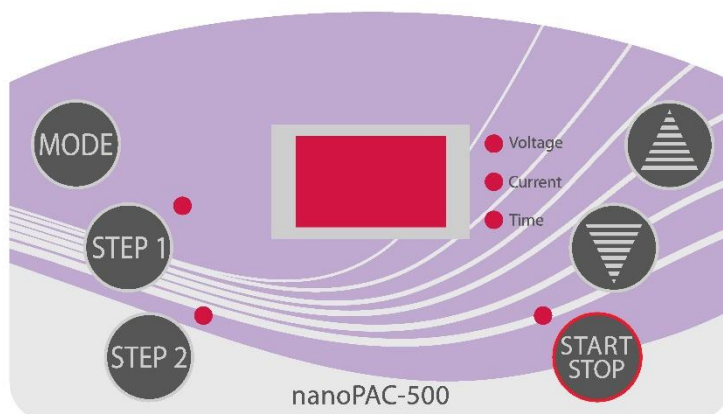
- No load detection
- Shrouded plugs and sockets
- Two pairs of outlet terminals
- Output voltage stability
- Economic choice for larger horizontal electrophoresis & 10 x 10 cm vertical electrophoresis
- New housing and exterior design

Operating Instructions

Installation

nanoPAC Series Power Supplies require no complex installation. As long as the unit is placed on a sturdy and level surface in a safe, dry place, and further connects with well-prepared electrophoresis systems, it is ready for operation.

Control Interface



	Switched between Voltage, Current and Time parameter settings		Increase the current parameter
	Selects the program interface for Step 1		Decrease the current parameter
	Selects the program interface for Step 2		Start or stop operation

Operation

1. Place the unit on a sturdy and level surface in a safe, dry place, away from laboratory traffic.
2. Ensure that the AC power switch is OFF, and then plug the three-

pronged power cord into a grounded three-prong AC outlet with appropriate voltage (100V to 240V as indicated on the rating sticker near the AC cord on the back of the unit)

3. Power on the unit by pressing the ON/OFF switch.
4. Connect the DC output jacks from the electrophoresis unit; insert the red lead (+) into the red output jack, and the black lead (-) into the black output jack.

One-step program

Set all the parameters of STEP 2 to zero, system will run STEP 1 without proceeding to STEP 2.




Constant voltage or current



Note: To operate under constant voltage or constant current modes, adjust the other parameter to the maximum value. For example, to operate under constant voltage, adjust current to max before running using constant voltage, and vice versa.

1. Adjust the output value by pressing the up or down buttons.
2. After adjusting your constant mode output value, switch to the other parameter and set it to maximum.
3. After setting the current or voltage output value, press "MODE" to switch to time setting mode, then press the up key or down key to adjust the timer accordingly. Setting 0 will result in a continuous run.
4. Press the Start key to begin the run, the LED will illuminate.
5. Press the stop key to stop the run when desired.
6. During a timed run, the alarm will sound upon completion, press the Start key to reset the alarm.

Troubleshooting

Many operating problems may be solved by carefully reading and following the instructions in this manual accordingly. Some suggestions for troubleshooting are given below. Should these suggestions not resolve the problem, contact our service department or a distributor in your region for assistance. If troubleshooting service is required, please include a full description of the problem.

Problem	Cause	Solution
No Display / lights	No AC power	Check if the power supply is unplugged, or AC power source problem
	AC power cord is not connected	Check AC power cord connections at both ends. Use the correct cords.
	The fuse has blown	Replace the fuse
Repeated fuse broken	Hardware failure	Contact Cleaver Scientific's service department
Operation stops	Electrophoresis leads are not connected to the power supply or to the electrophoresis unit(s), or there is a broken circuit in the electrophoresis cell	Check the connections to the power supply and on your electrophoresis cell to make sure the connection is intact; check condition of wires in electrophoresis unit. Close the circuit by reconnecting the cables. Press START/STOP to restart the run.
	High resistance due to tape left on a pre-cast gel, incorrect buffer concentration, or incorrect buffer volumes in the electrophoresis cell	Correct the condition by making sure the tape is removed from the pre-cast gel, buffers are prepared correctly, and the recommended volume of buffer is added to the electrophoresis unit.
 Error message	Over current(400mA limitation reached)	Check if the buffer concentration is appropriate. Excessive buffer concentration may cause over current issue. To clear the error message, press the START/STOP button again
 Error message	Over voltage(500V limitation reached)	Press START/STOP button to clear the error message. Contact Cleaver Scientific service dept. if the problem persists.
 Error message	Thermal limitation reached(Output voltage <10V)	(1) Check the connections (2) If Er3 error message persists, the problem may be caused by internal fan failure. Contact Cleaver Scientific service department.

 Message	No load is detected	(1) Check the connections (2) Check the buffer condition / buffer level
 Alarm message	Max. watts(120W) of power reached	Warning message for reference

Encountering Problems

1. Check the troubleshooting section.
2. Call Technical Service or e-mail to support@cleaverscientific.com
3. If the unit must be shipped back for repair, contact Cleaver Scientific or the distributor for a Return Authorization Number and shipping instructions. The unit will be repaired and returned to you as quickly as possible.

Care and Maintenance

Replacing the Fuse

For additional fuses, contact Cleaver Scientific Ltd.

1. To replace the fuse:
2. Turn off the main power switch at the rear of Power Supply and detach the power cord.
3. Open the fuse compartment located inside the Power Entry Module by inserting a small flat blade screwdriver into the slot below the ON/OFF switch. Turn the screwdriver to gently pry open the fuse compartment.

Note: The fuse compartment will not open with the power cord in place.

4. Pull the fuse holder out of the compartment and inspect the fuse. If the fuse is burned or there is a break in the fuse element, replace the fuse with an identical type of fuse (T3.15AH250V) as provided in the fuse holder (see figure below).
5. Place the fuse holder back into the compartment.
6. Snap the cover closed.

Maintenance

The nanoPAC Power Supply uses all solid-state components and should require no maintenance or recalibration under normal use. If the unit must be returned for repair, contact our SERVICE DEPARTMENT or your local authorized Cleaver Scientific distributor.

Ordering information

Cat. No.	Description
NANOPAC300P	Mini 300V, 400mA, 60W Power Supply
NANOPAC500	Mini 500V, 400mA, 120W Power Supply

Warranty

The Cleaver Scientific Ltd. (CSL) nanoPAC units have a warranty against manufacturing and material faults of twelve months from date of customer receipt.

If any defects occur during this warranty period, CSL will repair or replace the defective parts free of charge.

This warranty does not cover defects occurring by accident or misuse or defects caused by improper operation.

Units where repair or modification has been performed by anyone other than CSL or an appointed distributor or representative are no longer under warranty from the time the unit was modified.

Units which have accessories or repaired parts not supplied by CSL or its associated distributors have invalidated warranty.

CSL cannot repair or replace free of charge units where improper solutions or chemicals have been used. For a list of these please see the Care and Maintenance subsection.

If a problem does occur, then please contact your supplier or Cleaver Scientific Ltd:

Cleaver Scientific Ltd.

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Rugby, Warwickshire, CV22 7DH

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Email: info@cleaverscientific.com

