

# Instructions for use



## ROTH Power Supply MINI

Manufactured by Cleaver Scientific  
2907.1



**WARNING:**  
Please read the entire operator's manual thoroughly before operating this unit.

### Warning:

Like all apparatus run by electricity these units are capable of delivering potentially lethal voltage. They should be operated only by qualified technically trained personnel. The Roth power supplies are designed for long term laboratory use and to obtain reproducible results. Please spend a few moments reading the instruction manual thoroughly.

The Roth power supply series 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 power supply series 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 power supply 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 the equipment warranty.
3. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
4. Disconnect from the power source before maintenance and servicing. Refer servicing to qualified personnel.
5. Never use this instrument 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 as 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 the electrical source according to the local and national electrical codes. Failure to make a proper connection may create a 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.

Please verify that you received the unit completely (acc. to packing list) and without any damage. Any faults or losses have to be reported to ROTH immediately. ROTH can not accept responsibility for goods that were sent back without informing them.

**Please retain all packaging material until the warranty period has expired.  
For further information, please contact us at Tel.: 0721/5606-0.**

## **SAFETY INFORMATION**

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; it must NOT touch the surrounding. Follow the safety precautions for chemicals and dangerous materials. If needed, please contact us at Tel.: 0721/5606-0.

### **Environmental Conditions**

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

- Indoor use only
- RH ≤95 %
- 75 KPa-106 kPa
- Altitude not to exceed 2000 meters
- 4 °C ~ 40 °C operating temperature
- Pollution degree: 2
- Mains supply voltage fluctuations up to ± 10 % of the normal voltage

### **Avoiding Electrical Shock**

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

The Roth power supply series has been designed for use with insulated wires, minimizing any potential shock hazard to the user. We recommend against the use of uninsulated wires.

To avoid electrical shock:

1. In case of spillage, any parts of the cable or power supply must be dried out for a period of time and restored to NORMAL CONDITION before the operation.
2. NEVER connect or disconnect wire leads from the power jacks when the red indicator light of the power switch is on.
3. WAIT at least 5 seconds after stopping a run before handling output leads or 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 damaging the unit.
5. Do not operate the unit out of environmental conditions addressed above.
6. Do not operate the power supply 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.

### **Maintenance**

The ROTH power supplies require little maintenance to ensure reliable operation. The housing may be cleaned with a dry cloth.

## **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**

The following symbols are used on the power supplies:



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.

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

## **Encountering Problems**

- Check the troubleshooting section.
- Call Technical Service under 0049 721 5606-0

If the unit must be shipped back for repair, contact Carl Roth GmbH + Co. KG for shipping instructions. The unit will be repaired or replaced as quickly as possible and returned to you.

Contact: Phone 0049 721 5606-0; Fax 0049 721 5606-149; [info@carlroth.de](mailto:info@carlroth.de)

**All Roth products available for delivery have undergone rigorous quality controls.**

## **PACKING LIST**

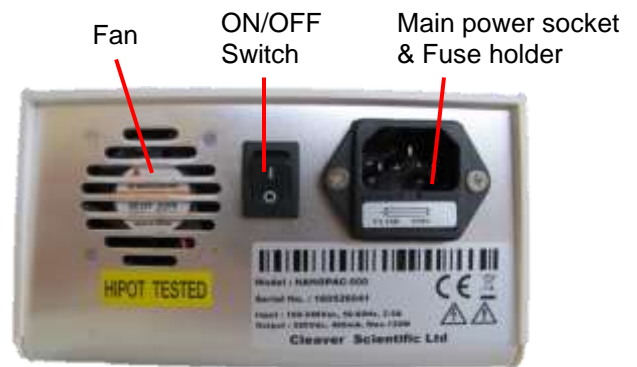
<b><u>No. Items</u></b>	<b><u>Description</u></b>
1	Power Supply
1	Power Cord
1	Instruction Manual

## DESCRIPTION

Combining small size and versatility, the newly redesigned Roth power supply MINI is an ideal choice for any researcher. Capable of providing constant current or constant voltage in 1 mA or 1 V steps, the microprocessor controlled 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 Roth power supply MINI 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 Roth MINI is also designed and constructed to the most rigorous safety standards. This makes it an excellent choice for education or personal use.



▲Front view



▲Rear view

## FEATURES

- Compact size
- Power capacity

Roth MINI
120W, 400mA, 500V

- 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 polycarbonate housing and aluminum bottom plates; new exterior design

## TECHNICAL DATA

### Roth Power Supply series

Type	MINI	STANDARD	BLOT
Model	nanoPAC-300P	PowerPro300	PowerPro3AMP
Voltage (V)	10-300	5-300	5-300
Max. intensity of current	1-400 mA	1-700 mA	10-3000 mA
Max. output power	60 W	150 W	300 W
Timer	1-999 min.	1-999 min.	1-999 min.
Volt-hours	49,995 kWh		
Display	LED	2,4" TFT	2,4" TFT
Resolution	1 V, 1 mA	1 V, 1 mA	1 V, 10 mA, 1 W
Type of output	Constant V or mA with automatic crossover		
	-	During constant mode not adjusted parameters are automatically set to maximum	
Programs	Manuell adjustable mode (Constant Mode)		
	2-step program editable	30 programs, each with up to 6 steps editable (Program Mode)	
	2-step program, pre-assigned*	Pre-assigned programs for different applications (Typical running condition Mode)	
Outlets (parallel socket pairs)	2 (4 mm)	5 (4 mm)	5 (4 mm)
Min. load resistor	5 $\Omega$	3 $\Omega$	0,1 $\Omega$
Safety detections	No load Over load Over temperature	No load Over load Leakage	No load Over load Leakage
Protection	-	Over temperature	Over temperature
Automatic recovery after power failure	-	Yes	Yes
IQ/OQ Protocols	-	Yes, optional	Yes, optional
Ambient temperature	4-40 °C	4-40 °C	4-40 °C
Regulatory	CE, ETL, FCC	CE, ETL	CE
Dimensions (cm)	14 x 19,1 x 8,4	21,5 x 33,5 x 10,4	21,5 x 33,5 x 10,4
Weight	1,0 kg	2,1 kg	2,1 kg
Rated Voltages	100-240 V, 50-60 Hz, 2,5 A	100-240 V, 47-60 Hz, 200 W	100-240 V, 47-60 Hz, 410 W

\* Step 1: 300 V / 16 mA / 30 min  
Step 2: 300 V / 24 mA / 240 min

**If voltage, current and time set 0 in step 2, system will not proceed to step 2.**

## INSTALLATION

ROTH power supply MINI is actually a pre-installed instrument. As long as it is placed on a sturdy and level surface in a safe, dry place, and further connects with well-prepared electrophoresis system, it is ready for operation.

## CONTROL INTERFACE








You will be able to find six buttons and 6 LED indicators from the faceplate. The LED indicates the status of the unit.

### Lighting Indications

LED light indicates operation condition while running.

- **Voltage** – Indicates the setting mode of voltage
- **Current** – Indicates the setting mode of current value
- **Time** – Indicates the setting mode of time

### Button Functions

1.  Before operation, press “MODE” to set the parameters of “Voltage”, “Current”, and “Time” of Step 1 and 2. LED light indicates your current parameter. For example, if you are setting a value for Voltage, the Voltage LED will be lit.
2.  Two step buttons are available for you to select the step and to check the parameters of voltage, current and time of each step. User will press “STEP 1” and “STEP 2” buttons mainly to switch between two steps.
3.  – Increase the value of current parameter.
4.  – Decrease the value of current parameter.
5.  – Start or stop operation.

## OPERATION





1. Place the power supply 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 of the appropriate voltage (100 V to 240 V 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 constant voltage, and vice versa.

1. Adjust the output value by pressing the  or  button.
2. After adjusting your constant mode output value, switch to the other parameter and set it to maximum.
3. **Timer Setting:** After setting the current or voltage output value, press "MODE" to switch to time setting mode, then press  key or  key to adjust timer accordingly. The run ends automatically when the timer runs out. The run ends automatically when the timer runs out.

**Note:** Setting 0 will result in a continuous run.

4. Press  Key to start the run. The LED light will light up.
5. Press  Key again to stop the unit at any time if necessary.
6. During a timed run, the alarm will sound upon completion. Press  Key to reset the alarm.
7. After finishing the run turn the AC power OFF by the switch on the rear. The programmed settings will be automatically saved into the system so the next time you turn it on, the same settings as your previous experiment will be displayed.

## TROUBLE SHOOTING

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 us at Tel.: 0721/5606-0 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 Mini power supply is unplugged, or if there is an 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 our 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 tank	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 <b>START/STOP</b> 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 tank	Correct the condition by making sure the tape is removed from the pre-cast gel, that the buffers are prepared correctly, and the recommended volume of buffer is added to the electrophoresis unit.

Error Message	Cause	Solution
Er 1	Current exceeds the maximum output for the power supply (>400 mA)	Check if the buffer concentration or molarity is appropriate. Excessive buffer concentration or molarity may increase conductivity. To clear the error message, press the <b>START/STOP</b> button.
Er 2	Voltage exceeds the maximum output for the power supply (>300 V)	Press the <b>START/STOP</b> button to clear the error message. Contact our service department if the problem persists.
Er 3	Thermal limitation of the power supply reached (Output voltage <10 V)	(1) Check the connections (2) If the <b>Er3</b> error message persists, the problem may be caused by internal fan failure. Contact our service department
nLd	No load is detected	(1) Check the connections (2) Check the buffer condition / buffer level
AL1	Power exceeds the maximum output (60 W)	Warning message for reference

**ROTH Power Supply MINI**

2907.1

1 unit

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The company is a limited partnership with headquarters in Karlsruhe, reg. court Mannheim HRA 100055. Roth Chemie GmbH, with headquarters in Karlsruhe, reg. court Mannheim HRB 100428, is the personally liable partner. Managing Director: André Houdelet. Sales tax identification number: DE 143621073.

ed 09/2021

