Instructions for use

ROTH Power Supply BLOT

Manufactured by Cleaver Scientific
2909.1

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

Warning:
Like all apparatus run by electricity this unit is capable of delivering potentially lethal voltage. It 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 BLOT 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 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 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 here 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, make sure that the voltage is within the range stated at the rating label and that the unit is earthed. Install the unit in a safe and dry place; it must NOT touch surrounding objects. 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: 300 V
Max. current: 700 mA
Max. watt: 150 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

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

PACKING LIST

No. Items	Description
1	Power Supply
1	Power Cord
1	Instruction Manual

DESCRIPTION

ROTH power supplies STANDARD and BLOT are a microprocessor controlled and designed to meet most electrophoresis needs in a personal, single, easy to use unit. The power supplies are capable of running DNA/RNA electrophoresis, electro-blotting, SDS-PAGE, native PAGE applications, and two-dimensional SDS-PAGE applications. Furthermore, the powerful specifications plus five terminal pairs can be used for multi electrophoresis units simultaneously.

▲Front view

▲Rear view

FEATURES

- Compact size
- Advanced capacity:

Roth STANDARD	**Roth BLOT**
150W, 700mA, 300V	300W, 3000mA, 300V

- Microprocessor controller
- Constant voltages, constant currents and constant power
- Five terminal outlets
- LCD display
- Timer with alarm function
- Advanced safety devices
- Stackability
- Wide applications for DNA, RNA and protein electrophoresis

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 kVh		
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 (= number of parallel socket pairs)	2 (4 mm)	5 (4 mm)	5 (4 mm)
Min. load resistor	5 Ω	3 Ω	0.1 Ω
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) (W x L x H)	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

INSTALLATION

ROTH power supply BLOT 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

LED Indicator: It indicates running condition

Button Functions

No.	Icon	Function
1		Press to activate or stop the unit
2		Press to temporarily interrupt power to an operation in progress; resume power after pausing without resetting the timer
3		Press to select either Constant/ Program Mode or Constant Voltage or Constant Current mode or Time
4		Press to enter the numeric value set up
5		Press to move cursor left forward between parameters
6		Press to move cursor right forward between parameters
7		Press to move cursor up between parameters and to increase numeric values
8		Press to move cursor down between parameters and to decrease numeric values

START THE OPERATION

1. Place the unit on a sturdy and level surface in a safe, dry place, away from laboratory traffic.

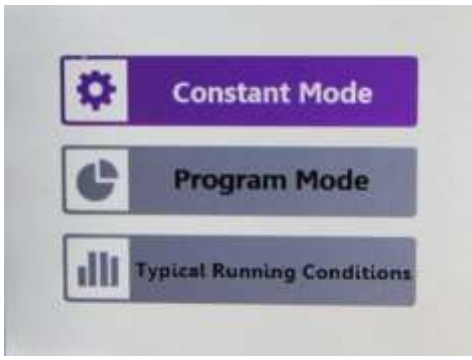
2. Ensure that the AC power switch is OFF, and then plug the three-pronged power cord one end into a grounded three-prong AC outlet with appropriate voltage (100V to 240V as indicated on the rating sticker near the AC cord on the back of the unit), and plug the other end into the main power socket.

3. 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.

4. Power on the unit by pressing the ON/OFF switch on the back.

5. The screen will show 

for few seconds then enter to the mode-selecting page.



Constant Mode

Use the **Constant Voltage / Current / Power Operation** for applications that require only one specific voltage limit, current limit, and power limit continuously during the entire operation of electrophoresis.

Note: When target constant mode is set, system automatically adjusts the other two parameters to maximum to allow constant run. For example, if constant voltage is set, system will adjust current and power to the maximum value.
Users could later lower the other two values by themselves. System will hold the value either at target constant value or the one which has been reached first.

- Use Key and Key to select **Constant Mode**, and then press either or to enter the next page.

- Use and to select ether Constant Voltage(V) or Constant Current(mA) or Constant Power(W), and then press or to enter the next page

- Use and to move cursor to the parameter such as voltage (V) current (mA) or power (W) or time (min.). Press Key to set the specified parameter.

- Use or to set the appropriate value, and then press Key, and move to the next parameter until all the parameters are set in the same operation method.

Note: If the time value is set “0,” it indicates the power supplier will constantly operate until user manually stops it.

- Press Key to start electrophoresis. The LED is lit, and the screen will show the real time parameter values.
- When parameters reach the assigned value, the color would turn orange.

- Press  to switch pages between real-time value display and value set up page.

- Press  Key to temporarily interrupt power to ongoing electrophoresis without terminating the operation. The LED is flashing. Press  Key to resume the run.
- Press the  Key again to stop electrophoresis and to terminate a timed run.

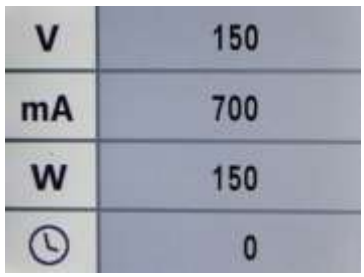
- When the run is completed, operation stops with alarm and 

is displayed on the screen. Press  Key to terminate a timed run, and turn the AC power OFF by the switch on the back.

Note: It would take some time (about 5 seconds) for the unit to power off.

Changing the limit values while electrophoresis is running

- If you need to make changes to the values of parameters during current running but do not want to terminate the time run, you may pause electrophoresis by pressing the  Key. Press  Key to enter the setting screen. Adjust the values and then press  Key to resume your operation.



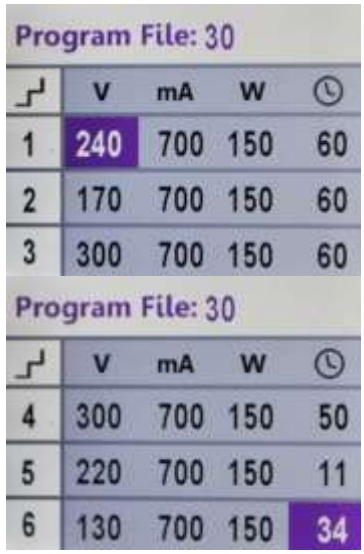
- If you want to change values of parameters and start *a new operation run* during current running, press  Key instead of  . After adjusting the values press  Key once again to start a new operation run.

Note: After stopping and restarting an operation, the timer resets to selected time and does not take into account the time that electrophoresis was in progress before it was stopped.

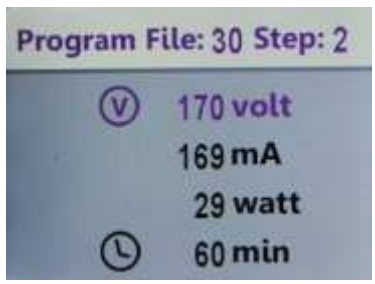
Program Mode

The **Program Mode** allows you to vary levels in voltage (V), current (mA), and power (W) during specified time periods for up to 6 Steps, depending upon your electrophoresis needs. The ROTH-Power Supply BLOT is capable of having 30 different program files storages for user's convenience. After starting the operation (see above), set the Program Mode as follow:

- Use Key and Key to select **Program Mode**, and then press either or to enter the next page.
- Press or Key to select appropriate file number, and then press or Key to enter the next page.

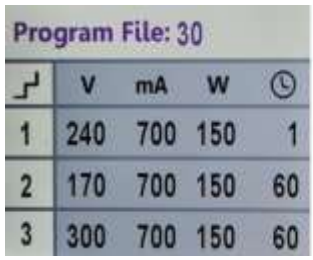


- Use , , or to move cursor to parameters such as voltage (V) current (mA) or power (W) or time (min.). Press Key and use and to set the appropriate value, and then press Key. Repeat this step until all the parameters are set properly. There are 6 stages available for use; use to move down for setting Stage 4-6, and to go back Stage 1-3.



- Press Key to start electrophoresis. The LED is lit, and the screen will show the real time parameter values.
- When parameters reach the assigned value, the color would turn orange.

- Press  to switch pages between real-time value display and value set up page.



- Press  Key to temporarily interrupt power to ongoing electrophoresis without terminating the operation. The LED is flashing. Press  Key to resume the run.

- Press the  Key again to stop electrophoresis and to terminate a timed run.

- When the run is completed, operation stops with alarm and COMPLETE is displayed on the screen. Press  Key to terminate a timed run, and turn the AC power OFF by the switch on the back.

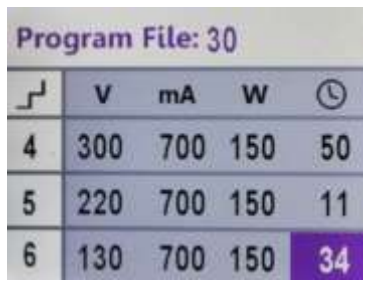
  Note: It would take a little time (about 5 seconds) for the unit to power off.

Changing the limit values while electrophoresis is running

- If you need to make changes to the values of parameters during current running but do not want to terminate the time run, you may pause electrophoresis by pressing the  Key. Press  Key to enter the setting screen.

  Adjust the values and then press  Key to resume your operation.

- If you want to change values of parameters and start a *new operation run* during current running, press  Key instead of  . After adjusting the values press  Key once again to start a new operation run.

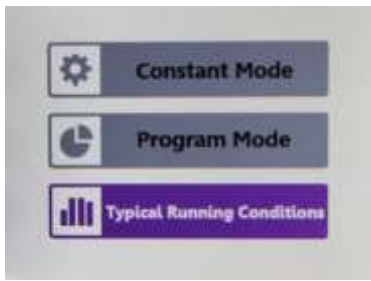


Note: After stopping and restarting an operation, the timer resets to selected time and does not take into account the time that electrophoresis was in progress before it was stopped.

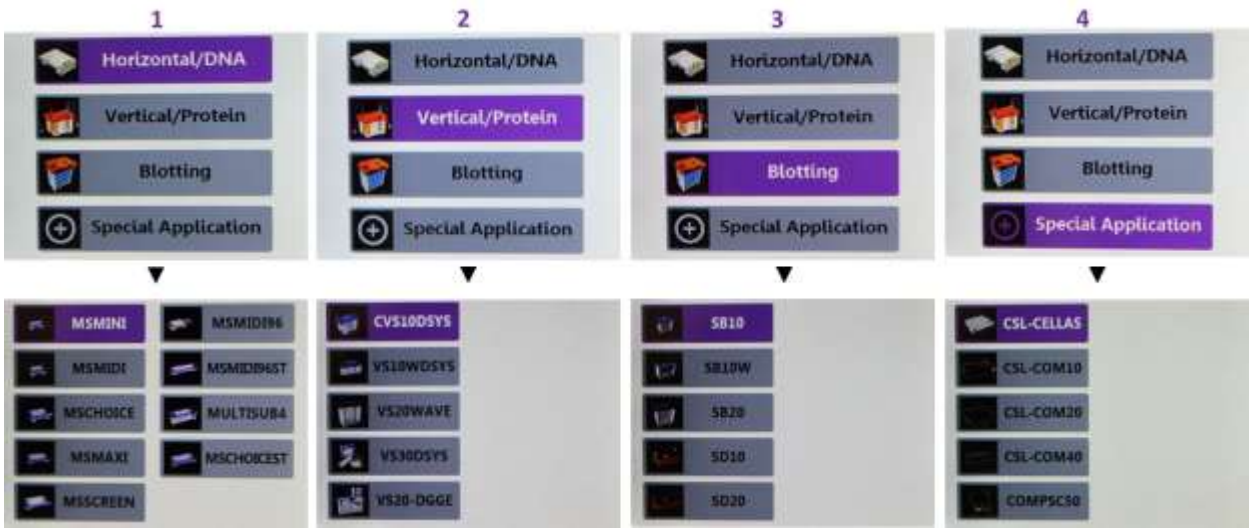
Typical Running Conditions

Besides Constant Mode and Program Mode, the ROTH-Power Supply BLOT provides a third option, **Typical Running Condition**. It is helpful for those beginning users who are not familiar with the parameter setting and is convenience for quick start.

- Turn on the unit; use  key to select and then press  to enter the next page.



- There are 4 categories that can be selected. Choose the model according to your experiment need.



- After selecting model, the preset value will display. User could adjust the value or simply just press  to start operation.

The typical running conditions refer to electrophoresis systems from Cleaver Scientific.

They correspond to the following electrophoresis systems from Carl Roth:

Art. No. Cleaver	Art. No. Roth	Product Name Roth
MSMINI	**2788.1**	Electrophoresis Unit ROTIPHORESE® PROfessional I
MSMIDI	**2799.1**	Electrophoresis Unit ROTIPHORESE® PROfessional II
MSCHOICE	**2850.1**	Electrophoresis Unit ROTIPHORESE® PROfessional III
MSCHOICEST	**9938.1** **9939.1**	Electrophoresis Unit ROTIPHORESE® PROfessional III Stretch 20 Electrophoresis Unit ROTIPHORESE® PROfessional III Stretch 25
MSMAXI	**2941.1**	Electrophoresis Unit ROTIPHORESE® PROfessional IV
MSSCREEN	**3000.1**	Electrophoresis Unit ROTIPHORESE® PROfessional V

Art. No. Cleaver	Art. No. Roth	Product Name Roth
CVS10DSYS	**3501.1**	Electrophoresis Unit ROTIPHORESE® PROclamp MINI
VS10WDSYS	**1395.1**	Electrophoresis Unit ROTIPHORESE® PROclamp MINI Wide
VS20WAVE	**5769.1**	Electrophoresis Unit ROTIPHORESE® PROclamp MAXI

Art. No. Cleaver	Art. No. Roth	Product Name Roth
SB10	**3513.1**	Tank Blotting System ROTIPHORESE® PROclamp MINI
SB10W	**3697.1**	Tank Blotting System ROTIPHORESE® PROclamp MINI Wide
SB20	**5814.1**	Tank Blotting System ROTIPHORESE® PROclamp MAXI
SD10	**KK58.1**	Semi dry blotter ROTIPHORESE® PROfessional MINI
SD20	**KK59.1**	Semi dry blotter ROTIPHORESE® PROfessional MAXI

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 the Technical Service of Roth at Tel.: 0721/5606-0 for assistance. If troubleshooting service is required, please include a full description of the problem.

Problem	Possible Causes	Solution
No Display / lights	No AC power	➢ Check if PowerPro power supply is plugged, or AC power source has 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 Technical Service
Operation stops and the screen displays 	Communication wires on circuit board have loosen or broken.	➢ Contact Technical Service
Operation stops with alarm: The screen displays 	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	➢ Make 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.
	High voltage application is set to run on a very low current	➢ DISABLE No Load alarm on the Display Screen
Operation stops with alarm. Display shows 	Bad connections for terminal connectors or damaged wires or damaged platinum wires	➢ Check all the connections to terminators, cables, wires, and gel tanks
Operation stops with alarm: Display shows 	Circuit is interrupted	➢ Verify that the running buffer is correct. ➢ Verify the all cables are attached correctly ➢ Turn the Power switch off and on again; restart application. ➢ If you cannot restart the instrument, turn off the power, disconnect the power cord from the outlet, and contact Technical Service.

Operation stops with alarm: Display shows OVER CURRENT	Circuit is interrupted	➢ Verify that the running buffer is correct. ➢ Verify the all cables are attached correctly ➢ Turn the Power switch off and on again; restart application. ➢ If you cannot restart the instrument, turn off the power, disconnect the power cord from the outlet, and contact Technical Service.
Operation stops with alarm: Display shows LEAKAGE	Ground leak detected during run	➢ Check the electrophoresis system for improper grounding. Restart the power supply by turning the Power switch off and on.
Operation stops with alarm: Display shows OVER TEMPERATURE	Power supply is overheating	➢ Turn off power supply. Check for sufficient airflow around the power supply fan. After cooling down, restart the power supply by turning the Power switch to the on position. ➢ If you cannot restart the instrument, turn off the power, disconnect the power cord from the outlet, and contact Technical Service.
Warning message displays with 5-second beep sound. The screen shows Power Recovery	The power once been cut and now recover	➢ User does not need to take extra action. The warning sign and beep sound would only last for 5 second; after that, the machine will continue running the unfinished project. ➢ The  sign indicates the machine has been interrupted by sudden power off. Press Enter Key  to clear the sign.

ROTH Power Supply BLOT	2909.1	1 unit

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