

Consort

MANUAL

HANDLEIDING

MODE D'EMPLOI

ANLEITUNG



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EV202
EV222
EV215
EV231
EV232
EV233
EV243
EV261
EV262
EV265

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Introduction

This instrument is manufactured with the latest technology and needs no particular maintenance. **Consort** certifies that this instrument was thoroughly inspected and tested at the factory prior to shipment and found to meet all requirements defined by contract under which it is furnished. However, dimensions and other physical characteristics may differ.

The normal operating temperature should be between 0° and 40°C. Never use the instrument in a room with high humidity (>95 %) or at very low temperatures (condensation water!).

Connect the instrument only to an earthed power line. The required power source is indicated on the label at the back of the instrument. Do not cut and splice the power cord. When removing the power cord from the wall outlet, be sure to unplug by holding the plug attachment and not by pulling the cord. Do not hold the plug by wet hand.

Manufacturer

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Warranty

This instrument (excluding all accessories) is warranted against defective material and workmanship for a period of thirty-six (36) months from the date of shipment ex factory. **Consort** will repair all defective equipment returned to it during the warranty period without charge, provided the equipment has been used under normal laboratory conditions and in accordance with the operating limitations and maintenance procedures in this instruction manual and when not having been subject to accident, alteration, misuse or abuse. A return authorisation must be obtained from **Consort** before returning any product for warranty repair on a freight prepaid basis!

Consort is not liable for consequential damages arising out of the use or handling of its products.

Servicing

In the event of this instrument being returned for servicing, the owner is requested to remove the power supply lead and **NOT** to send the following items unless they are suspect:

Manual

Cables

Accessories

If serious malfunctioning occurs, stop using the unit immediately and consult your local **Consort** dealer.

Keyboard

↑↓ = Button for entering a value or for selecting a function.

SET/ENTER = Button for programming the desired parameters.

RUN/STOP = Button to start or stop an experiment.

This electrophoresis power supply is a high technology instrument available in several versions. As it is capable of giving dangerous voltage levels by which high power is involved, we suggest that you take a few moments to read this manual thoroughly. Although this instrument is equipped with all necessary safety features against abuse and other accidental failures, caution should be exercised when working with high voltage equipment.

- **Avoid to touch the outlets with any conducting object** and make sure there is a second person present for your safety in case of any severe electric shock.
- Never touch any part of the assembly (power supply, leads or tank) before having switched off.
- **Never manipulate with wet hands.**
- **Do not ground any of the outputs or the buffer in the tank.**
- Connect the outlets only to an insulated electrophoresis tank with safety cover.
- Never make any other connections, such as e.g. putting several power supplies in series or in parallel.
- In order to prevent electric shock, never open the back plate nor remove the cover.
- Do not expose the unit to rain or any other liquid.
- **Do not spill liquid or insert metal objects inside the unit.**
- Take care so that the power supply is not dropped to avoid damaging the cabinet which defeats safeguards or injuring yourself.
- If the unit has been dropped or the cabinet has been damaged, unplug it and have it checked by an authorised service technician to restore the safeguards.
- The fact that the unit operates satisfactorily does not imply that the unit is properly earthed or that it is completely safe. If in any doubt about the effective earthing of the unit, contact a qualified electrician.
- **Never block the ventilation holes** or place the unit in any enclosure unless proper ventilation is provided.
- Never place the unit near or over a radiator, heat register or stove.
- Avoid locations where the instrument is exposed directly to the sun light.

Set-up

---- **STAND-BY** ----
SET-UP

---- **SET-UP** ----
LANGUAGE

CHOOSE LANGUAGE:
ENGLISH

---- **SET-UP** ----
CONTRAST

---- **SET-UP** ----
ALARM

CURRENT < 1mA
ALARM: YES

---- **SET-UP** ----
POWER FAIL

POWER FAIL
DETECTION: YES

---- **SET-UP** ----
STAND-BY

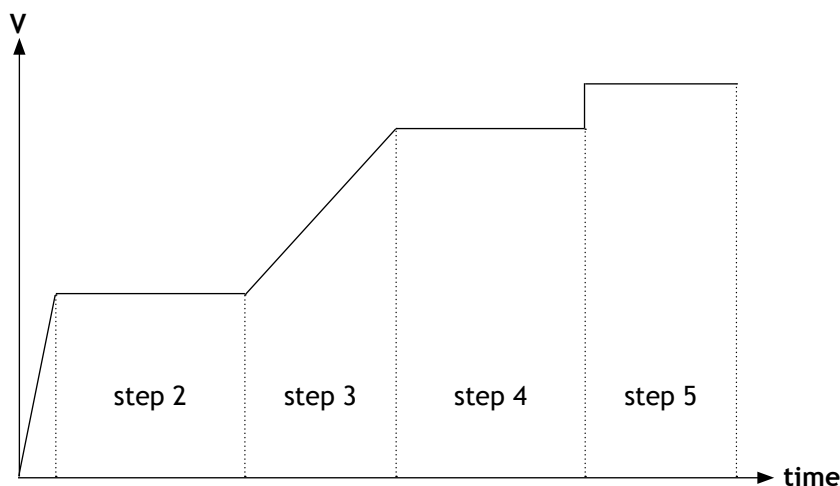
---- **SET-UP** ----
INFO

1. Select **SET-UP** and press **SET**.
2. Select **LANGUAGE** and press **SET**.
3. Select the desired language and press **SET**.
4. Select **CONTRAST** and press **SET**.
5. Adjust the contrast of the display and press **SET**.
6. Select **ALARM** and press **SET**.
7. Decide whether or not the output voltage should shut down at a too low output current and press **SET**.
8. Select **POWER FAIL** and press **SET**.
9. Decide whether or not the instrument should proceed with the experiment for the remaining time after a power failure and press **SET**.
10. Select **STAND-BY** and press **SET** to return.

- Select **INFO** and press **SET** to see general information about the electrophoresis power supply.

Method programming permits to store up to 9 different methods, each with 9 steps, of frequently used parameters in the non-volatile memory for future recall. Each step is able to recall a next one, providing a flexible multiple step function for special techniques. The method mode also permits to program a linear voltage gradient for any step provided the limiting current or power is not attained. Parameters can be changed temporarily without interrupting the run.

1. Verify if the instrument is switched off.
 2. Connect the electrophoresis tank to the instrument.
 3. Switch the instrument on. If the timer is still running after switching on, the power supply will automatically proceed with the experiment for the remaining time. Press **STOP** (within 10 seconds) if you want to go in stand-by during the run. The parameters can then be changed eventually. Press **RUN** to proceed with the experiment or press **SET**, during 2 seconds, to go in stand-by again.
 4. Select the **METHOD** mode and press **SET**.
 5. Select the desired method and press **SET**.
 6. Select the desired step and press **SET**.
 7. Decide whether or not a voltage gradient has to be performed and press **SET**.
 8. Enter the desired voltage limit and press **SET** (= the voltage end point in case of a gradient step).
 9. Enter the desired current limit and press **SET** (this limit is automatically set to maximum and cannot be changed in case of a gradient step).
 10. Enter the desired power limit and press **SET** (this limit is automatically set to maximum and cannot be changed in case of a gradient step).
 11. Enter the desired time-units (h of kWh) and press **SET**.
 12. Enter the desired time and press **SET**.
 13. Decide if the experiment should automatically proceed with a next step (resuming from point 6) or stop after this step. Enter the desired procedure and press **SET**.
 14. Press **RUN** to start the experiment.
- At any time, you can return in the stand-by mode by holding **SET** pressed during 2 seconds.
 - At any time, you can avoid programming unnecessary parameters. To do so, simply press **RUN** instead of **SET** after entering the last relevant value and the instrument will immediately start the experiment keeping the other parameters to their previous values.
 - To ensure that the desired parameter is kept constant, we suggest to pre-set all other parameters to maximum.
 - A blinking unit of the controlling parameter appears when the regulation is complete.
 - The timer will always count down.



TIMER ACTIVE!	
STOP NOW?	10s

----	STAND-BY	----
METHOD		

ENTER	1J1
METHOD:	1

ENTER	1J1
STEP:	1

ENTER	1J1
GRADIENT:	NO

ENTER	1J1
VOLTAGE:	400V

ENTER	1J1
CURRENT:	300mA

ENTER	1J1
POWER:	50W

ENTER	1J1
TIME UNIT:	h

ENTER	1J1
TIME:	99:59h

ENTER	1J1
END METHOD:	YES

RUN	1J1	99:59h
400V	300mA	50W

Manual programming

TIMER ACTIVE!		
STOP NOW?		10s

----	STAND-BY	----
MANUAL		

ENTER		
VOLTAGE:		400V

ENTER		
CURRENT:		300mA

ENTER		
POWER:		50W

ENTER		
TIME UNIT:		h

ENTER		
TIME:		99:59h

RUN		
		99:59h
400V	300mA	50W

Manual programming permits to set voltage, current, power and time limits for a simple routine electrophoresis run. Parameters can be changed temporarily without interrupting the run.

1. Verify if the instrument is switched off.
2. Connect the electrophoresis tank to the instrument.
3. Switch the instrument on. If the timer is still running after switching on, the power supply will automatically proceed with the experiment for the remaining time. Press **STOP** (within 10 seconds) if you want to go in stand-by during the run. The parameters can then be changed eventually. Press **RUN** to proceed with the experiment or press **SET**, during 2 seconds, to go in stand-by again.
4. Select the **MANUAL** mode and press **SET**.
5. Enter the desired voltage limit and press **SET**.
6. Enter the desired current limit and press **SET**.
7. Enter the desired power limit and press **SET**.
8. Enter the desired time-units (hours or kilovolthours) and press **SET** (EV222: time-unit is fixed to hours).
9. Enter the desired time and press **SET** (pre-set to [--:--] if no timing is required).
10. Press **RUN** to start the experiment.

- At any time, you can return in the stand-by mode by holding **SET** pressed during 2 seconds.
- At any time, you can avoid programming unnecessary parameters. To do so, simply press **RUN** instead of **SET** after entering the last relevant value and the instrument will immediately start the experiment keeping the other parameters to their previous values.
- To ensure that the desired parameter is kept constant, we suggest to pre-set all other parameters to maximum.
- A blinking unit of the controlling parameter appears when the regulation is complete.
- The timer will always count down. However, when no time limit has been programmed it will count up.

Temporarily changing parameters

SET	1J1	99:59h
400	300mA	50W

SET	1J1	99:59h
400V	300	50W

SET	1J1	99:59h
400V	300mA	50

SET	1J1	99:59
400V	300mA	50W

Only the parameters of the running step can be changed. A gradient step can never be changed.

1. Press **SET** to change temporarily the parameters without interrupting the run.
2. Change the actual voltage limit and press **SET**.
3. Change the actual current limit and press **SET**.
4. Change the actual power limit, and press **SET**.
5. Change the actual time and press **SET**.
6. The power supply will now continue the run.

- Temporarily changed parameters are not been kept in memory!
- The instrument will automatically return to the run mode when no button has been pressed during 10 seconds.

1. Select **SET-UP** and press **SET**.
2. Select **DATA** and press **SET**.
3. Select **DURATION** and press **SET**.
4. Select the desired time for the data-logging and press **SET**.
5. Select **LOG** and press **SET**.
6. Decide whether or not all data (voltage, current, power, time) during the next experiments should be logged and press **SET**.
7. Select **SET-UP** and press **SET** to return.

- Starting a new experiment will erase the previous data in memory.
- Stored data can be transferred to a computer via the RS232 output using free available software (www.consort.be).
- At any time, you can return in the stand-by mode by holding **SET** pressed during 2 seconds.

```

----  STAND-BY  ----
          SET-UP
  
```

```

----  SET-UP  ----
          DATA
  
```

```

-----  DATA  -----
          DURATION
  
```

```

LOG DATA
FOR:                                     10h
  
```

```

-----  DATA  -----
          LOG
  
```

```

LOG
DATA:                                     YES
  
```

```

-----  DATA  -----
          SET-UP
  
```

Alarms

- | | |
|-----------------------|--|
| GROUND LEAKAGE | = A dangerous ground leakage is present (check thoroughly the complete assembly). Your power supply is NOT defective! See <i>Frequently Asked Questions</i> at the end of this manual. |
| SHORT-CIRCUIT | = Connected tank is short-circuited or has a very low resistance (check thoroughly the complete assembly). Your power supply is NOT defective! See <i>Frequently Asked Questions</i> at the end of this manual. |
| OVERLOAD | = Connected tank has a too low resistance (check specifications). Your power supply is NOT defective! See <i>Frequently Asked Questions</i> at the end of this manual. |
| CURRENT<1mA | = The output current is lower than 1 mA (switch the alarm off in the SET-UP menu). Your power supply is NOT defective! See <i>Frequently Asked Questions</i> at the end of this manual. |
| CALL SERVICE | = Failure in the electronics. See <i>Support</i> on www.consort.be . |

```

***  ERROR  ***
      GROUND LEAKAGE
  
```

```

***  ERROR  ***
      SHORT-CIRCUIT
  
```

```

***  ERROR  ***
      OVERLOAD
  
```

```

***  ERROR  ***
      CURRENT<1mA
  
```

```

***  ERROR  ***
      CALL SERVICE
  
```

- You could also try a general **RESET**: switch the instrument on while holding **SET** pressed. **Attention!** All stored programs and data will be erased!

Specifications	EV243	EV231	EV265
VOLTAGE	0...400 V	0...300 V	0...600 V
CURRENT	0...300 mA	0...1000 mA	0...500 mA
POWER	0...50 W	0...150 W	0...150 W
PARAMETER RANGE	1...100% of full scale	1...100% of full scale	1...100% of full scale
TIMER	0...99:59 h	0...99:59 h	0...99:59 h
VOLT-HOURS	0...99.99 kWh	0...99.99 kWh	0...99.99 kWh
DISPLAY	LCD, 2x16 characters	LCD, 2x16 characters	LCD, 2x16 characters
RESOLUTION	1 V, 1 mA, 1 W	1 V, 1 mA, 1 W	1 V, 1 mA, 1 W
PROGRAMS	9x9 set of parameters	9x9 set of parameters	9x9 set of parameters
OUTPUTS	3 in parallel, 4 mm sockets	4 in parallel, 4 mm sockets	4 in parallel, 4 mm sockets
MIN. LOAD RESISTANCE	30 Ω	10 Ω	30 Ω
NO LOAD DETECTION	on/off, programmable	on/off, programmable	on/off, programmable
GROUND LEAKAGE DETECTION	✓	✓	✓
OVERLOAD DETECTION	✓	✓	✓
COMPUTER CONTROL	✓	✓	✓
DATA-LOGGING	3600 values	3600 values	3600 values
RS232	9600 b/s	9600 b/s	9600 b/s
AMBIENT TEMPERATURE	0...40°C	0...40°C	0...40°C
RELATIVE HUMIDITY	0...95%, non condensing	0...95%, non condensing	0...95%, non condensing
POWER REQUIREMENTS	210...250 VAC, 50/60 Hz, 75 W	210...250 VAC, 50/60 Hz, 200 W	210...250 VAC, 50/60 Hz, 200 W
DIMENSIONS (WxDxH)	24x20x13 cm	31x26x15 cm	31x26x15 cm
WEIGHT	3 kg	6 kg	6 kg

Specifications	EV202	EV261	EV215
VOLTAGE	0...300 V	0...600 V	0...1200 V
CURRENT	0...2000 mA	0...1000 mA	0...500 mA
POWER	0...300 W	0...300 W	0...300 W
PARAMETER RANGE	1...100% of full scale	1...100% of full scale	1...100% of full scale
TIMER	0...99:59 h	0...99:59 h	0...99:59 h
VOLT-HOURS	0...99.99 kWh	0...99.99 kWh	0...99.99 kWh
DISPLAY	LCD, 2x16 characters	LCD, 2x16 characters	LCD, 2x16 characters
RESOLUTION	1 V, 1 mA, 1 W	1 V, 1 mA, 1 W	1 V, 1 mA, 1 W
PROGRAMS	9x9 set of parameters	9x9 set of parameters	9x9 set of parameters
OUTPUTS	4 in parallel, 4 mm sockets	4 in parallel, 4 mm sockets	4 in parallel, 4 mm sockets
MIN. LOAD RESISTANCE	5 Ω	15 Ω	70 Ω
NO LOAD DETECTION	on/off, programmable	on/off, programmable	on/off, programmable
GROUND LEAKAGE DETECTION	✓	✓	✓
OVERLOAD DETECTION	✓	✓	✓
COMPUTER CONTROL	✓	✓	✓
DATA-LOGGING	3600 values	3600 values	3600 values
RS232	9600 b/s	9600 b/s	9600 b/s
AMBIENT TEMPERATURE	0...40°C	0...40°C	0...40°C
RELATIVE HUMIDITY	0...95%, non condensing	0...95%, non condensing	0...95%, non condensing
POWER REQUIREMENTS	210...250 VAC, 50/60 Hz, 360 W	210...250 VAC, 50/60 Hz, 360 W	210...250 VAC, 50/60 Hz, 360 W
DIMENSIONS (WxDxH)	31x26x15 cm	31x26x15 cm	31x26x15 cm
WEIGHT	10 kg	10 kg	10 kg

Specifications	EV232	EV233	EV262
VOLTAGE	0...3000 V	0...3000 V	0...6000 V
CURRENT	0...150 mA	0...300 mA	0...150 mA
POWER	0...150 W	0...300 W	0...300 W
PARAMETER RANGE	1...100% of full scale	1...100% of full scale	1...100% of full scale
TIMER	0...99:59 h	0...99:59 h	0...99:59 h
VOLT-HOURS	0...99.99 kWh	0...99.99 kWh	0...99.99 kWh
DISPLAY	LCD, 2x16 characters	LCD, 2x16 characters	LCD, 2x16 characters
RESOLUTION	1 V, 1 mA, 1 W	1 V, 1 mA, 1 W	1 V, 1 mA, 1 W
PROGRAMS	9x9 set of parameters	9x9 set of parameters	9x9 set of parameters
OUTPUTS	4 in parallel, 4 mm sockets	4 in parallel, 4 mm sockets	4 in parallel, 4 mm sockets
MIN. LOAD RESISTANCE	600 Ω	300 Ω	1200 Ω
NO LOAD DETECTION	on/off, programmable	on/off, programmable	on/off, programmable
GROUND LEAKAGE DETECTION	✓	✓	✓
OVERLOAD DETECTION	✓	✓	✓
COMPUTER CONTROL	✓	✓	✓
DATA-LOGGING	3600 values	3600 values	3600 values
RS232	9600 b/s	9600 b/s	9600 b/s
AMBIENT TEMPERATURE	0...40°C	0...40°C	0...40°C
RELATIVE HUMIDITY	0...95%, non condensing	0...95%, non condensing	0...95%, non condensing
POWER REQUIREMENTS	210...250 VAC, 50/60 Hz, 200 W	210...250 VAC, 50/60 Hz, 360 W	210...250 VAC, 50/60 Hz, 360 W
DIMENSIONS (WxDxH)	31x26x15 cm	31x26x15 cm	31x26x15 cm
WEIGHT	6 kg	10 kg	10 kg

What are the relations between Voltage, Current, Power and Resistance?

Power (W) = Voltage (V) x Current (A)

Resistance (Ω) = Voltage (V) / Current (A)

How does a power supply react after pressing RUN?

The internal generator will start building up the high voltage at the output terminals while voltage and current are constantly measured and power calculated. When one of the pre-set parameters is exceeded, the generator stops and will keep that parameter constant.

How important is the resistance of an electrophoresis unit?

The resistance of an electrophoresis unit depends on its size, gel thickness, amount of buffer, buffer conductivity and temperature. This resistance will normally decrease in time due to a slowly increasing temperature. Electrophoresis units which have a resistance below the minimum load resistance of a power supply will trigger an alarm! Read the output voltage and current during a run to measure the resistance and use above formula to calculate the value.

How to keep a constant voltage during a run?

Program the desired voltage and a higher current and power than the maximum expected values:

Current > Voltage / Resistance

Power > Voltage x Current

How to keep a constant current during a run?

Program the desired current and a higher voltage and power than the maximum expected values:

Voltage > Current x Resistance

Power > Voltage x Current

How to keep a constant power during a run?

Program the desired power and a higher voltage and current than the maximum expected values:

Voltage > Current x Resistance

Current > Voltage / Resistance

Why are my output values different from those of a similar experiment?

Either your programmed parameters are not equal to those described or the resistance of your electrophoresis unit is different (see above). It cannot be due to e.g. an other model of power supply as the relations between Voltage, Current, Power and Resistance are monitored in the same way by any instrument (the electrical laws cannot be disregarded!).

What about connecting more than one unit to the same power supply?

The outlets being in parallel each electrophoresis unit will be supplied with exactly the same voltage. However, current and power may differ due to differences between them even when exactly the same model, gel, buffers, etc... are used. Therefore, it is recommended to run several electrophoresis units only in the constant voltage mode on the same power supply.



DECLARATION OF CONFORMITY

We declare under our sole responsibility that the product

Electrophoresis Power Supply

content of the type numbers

EV202, EV222, EV215, EV231, EV232, EV233, EV243, EV261, EV262, EV265

to which this declaration relates is in conformity

with the following standards

EN61010

LOW VOLTAGE DIRECTIVE 73/23/EEG

EN50081-1

EN50082-1

EN60555-2

EMC DIRECTIVE 89/336/EEG

Turnhout, February 22, 2005

A handwritten signature in black ink, appearing to be 'G. Consort', is located above the text 'on behalf of Consort'.

on behalf of Consort

WARRANTY CERTIFICATE

This instrument (excluding all accessories) is warranted against defective material and workmanship for a period of thirty-six (36) months from the date of shipment ex factory. Accessories and breakable items such as electrodes are not warranted unless proven to be defective before shipment.

The original purchase order numbers, Consort invoice numbers and serial numbers of the products must be provided.

CONSORT will repair all defective equipment returned to it during the warranty period without charge (CIF Turnhout prepaid by sender), provided the equipment has been used under normal laboratory conditions and in accordance with the operating limitations and maintenance procedures described in the instruction manual and when not having been subject to accident, alteration, misuse or abuse.

If the products have been used with or have come into contact with fluids, an MSDS (material safety data sheet) must be supplied prior to issuing a return authorisation.

A return authorisation must be obtained from **CONSORT** before returning any product for warranty repair on a freight prepaid basis!