***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 4° and 40°C. Never store the instrument in a room with high humidity 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***

**CONSORT nv**
Parklaan 36 Tel (++32)(14)41 12 79
B2300 Turnhout Fax (++32)(14)42 91 79
Belgium

***Warranty***

This instrument (excluding all accessories) is warranted against defective material and workmanship for a period of thirty (30) months from the date of purchase by the customer or thirty-six (36) months from the date of shipment ex factory, whichever is earlier. **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** 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.

***Specifications***

| | | |
|---|---|---|
| **Ranges** | **E432:** | 0 ... 3000 V / 0 ... 150 mA / 0 ... 150 W / 0 ... 100°C |
| | **E413:** | 0 ... 1500 V / 0 ... 300 mA / 0 ... 150 W / 0 ... 100°C |
| **Timer** | | 1 ... 999 min. |
| | | 0.1 ... 99.9 h |
| | | 0.1 ... 99.9 kVh |
| **Outputs** | | dual in parallel, floating |
| **Leakage detection** | | > 500 µA |
| **No load detection** | | < 0.1 W |
| **Minimum load resistance** | | E432: > 400 Ω |
| | | E413: > 150 Ω |
| **Ambient temp.** | | 4 ... 40°C |
| **Rel. humidity** | | 0 ... 90 % (non-condensing!) |
| **Power supply** | | 210-250 V~ (* 105-125 V~), 50/60 Hz |
| **Cabinet** | | rugged plastic/metal cabinet |
| **Dimensions** | | 300 x 120 x 180 mm |
| **Weight** | | 5 kg |

***Very important***

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. Since all power supplies are equipped with an automatic cross over between the different possible modes (constant voltage, current, or power), it is important to pre-set the proper parameters. 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. Therefore, **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.

***Pre-set limits***

Parameters can be pre-set within the following limits:

E432 : 0.03 - 3.00 kV / 2 - 150 mA / 2 - 150 W / 1 - 100°C
E413 : 0.02 - 1.50 kV / 3 - 300 mA / 2 - 150 W / 1 - 100°C

***Keyboard***

▲ = button for manually increasing a value.
▼ = button for manually decreasing a value.
**SET** = button for programming the desired parameters, while the instrument is in standby.
**RUN** = button to start an experiment.

***Programming***

**1.** Verify if the instrument is switched off.
**2.** Connect the electrophoresis tank to the instrument.
**3.** Connect eventually a model E205 temperature probe to the black banana terminals on the back of the instrument.
**4.** Switch the instrument on. If the timer (or volthour integrator) is still running, the power supply will automatically proceed with the experiment for the remaining time. Press **SET** if you wish to program new parameters or want to go in standby during the run.
**5.** The display shows [OFF]. Press **SET** to select one of the 9 possible programs.
**6.** The display shows e.g. [Set][PrG.3] . Select the desired program with ▲ or ▼ and press **SET**.
**7.** The display shows e.g. [1.45](kV)[SEt.3], while the constant voltage indicator is blinking. Enter the desired voltage limit with ▲ or ▼ and press **SET**.
**8.** The display shows e.g. [120](mA)[SEt.3], while the constant current indicator is blinking. Enter the desired current limit with ▲ or ▼ and press **SET**.
**9.** The display shows e.g. [73](W)[SEt.3], while the constant power indicator is blinking. Enter the desired power limit with ▲ or ▼ and press **SET**.
**10.** The display shows e.g. [45°](°C)[SEt.3], while the constant temperature indicator is blinking. Enter the desired temperature limit with ▲ or ▼ and press **SET**.
**11.** The display shows [HrS](h)[Set.3], [Min'][Set.3] or [int.][Set.3] (volthour integrator). Select the desired time-units with ▲ or ▼ and press **SET**.
**12.** The display shows e.g. [17.2](h)[SEt.3], while the time-indicator is blinking. Enter the desired time with ▲ or ▼ and press **SET**. Pre-set to zero if no timing is required.
**13.** The instrument will let you choose between e.g. [End.3][SEt.3] or e.g. [run.4][SEt.3]. The experiment will automatically proceed with a next set of parameters (multiple step programming), when [run.X] is entered. [End] means that the experiment has to stop after this program. Select the desired procedure with ▲ or ▼ and press **SET**.
**14.** Press **RUN** to start the experiment.

**Note:**

- *Press ⮜ to display (left) the voltage, current, power, temperature, time, or program number of the apparatus connected to the left output.*
- *Press ⮞ to display (right) the voltage, current, power, temperature, time, or program number of the apparatus connected to the right output.*
- *Both displays will alternate automatically (±4 s interval) between all parameters by pressing ⮜ and ⮞ together until [ALt] is shown.*
- *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, pre-set all other parameters to maximum.*
- *The automatic crossover indicators will only illuminate when the regulation is complete and one of the parameters is kept constant.*
- *The timer of the previous run is automatically reset when a new program is selected.*

### *Error codes*

[End] = Normal end of the experiment.
[OFF] = Standby mode (no high voltage on the outputs).
[no][LOAd] = Minimum load of 0.1 W is not reached! Connected tank has a too high resistance (adapt the buffer solution).
[ALrM][°C] = Temperature overrange or interrupted temperature probe.
[ALrM][Gnd] = A dangerous ground leakage is present (check thoroughly the complete assembly).
[ALrM][LOAd] = An abnormal change in the resistance of the apparatus or an arcing in the assembly is detected.
[ALrM][Shrt] = Short-circuit condition! Connected tank has a too low resistance (check thoroughly the complete assembly).
[ALrM][FAIL] = No regulation (check AC input voltage).

### *Safety precautions*

This instrument is equipped with floating outputs on which the high voltage cannot suddenly appear. The built-in microcomputer will always smoothly increase the voltage till one of the pre-set limits is reached.

The unit is fully protected against any overload condition by a special safety system which automatically disconnects the AC line from the high voltage transformer if:

- *a ground leakage current of more than 500 µA is detected.*
- *an abnormal change in the resistance of the apparatus is detected.*
- *a break in the circuit through the apparatus is detected*
- *an arcing in the assembly is detected.*
- *none of the parameters can be kept constant.*
- *the output is short circuited.*
- *the instrument is switched off.*

A flashing error code in the display and a pulsing acoustic alarm is activated whenever a dangerous condition is present.