

# *CMA 600 Microdialysis Analyser*



u s e r ' s m a n u a l

Windows 98/2000/XP



**CMA** / *Microdialysis*

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User manual for CMA 600  
Software version 1.37

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Printed in Sweden

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All devices from CMA Microdialysis AB are intended for use by qualified medical personnel only.

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# 1. Introduction

## 1.1. Introduction

CMA 600 Microdialysis Analyzer was developed for the small sample volumes of dialysates obtained when sampling by microdialysis. The CMA 600 uses colorimetric measurement, enzyme reagents, and needs only 1/10 of the conventional sample and reagent volumes required by other instruments. The CMA 600 should only be used for microdialysates. Samples can be analyzed one at a time or in batch.

CMA 600 Microdialysis Analyzer is computer controlled and can be integrated in a mobile system. The software (operating under Microsoft Windows™) is dedicated for microdialysis samples and the results are displayed graphically.

The CMA 600 comes with additional software that facilitates quick and easy graphical analysis of the results.

Samples from up to three individuals each with one to three catheters can be analyzed simultaneously. Note that no reference values have been established for microdialysates.

There are two combinations of CMA 600; "CMA 600 Microdialysis Analyzer for bedside use", this is the mobile system, and "CMA 600 Microdialysis Analyzer for laboratory use" (see Figure 4 and Figure 5).

Methods for analysis of a number of substances have been developed by CMA/Microdialysis.

CMA 600 is easy to use: The microvial is transferred from the sample holder to the analyzer, one button is pushed, the result appears as a new point on the trend curve within a minute.

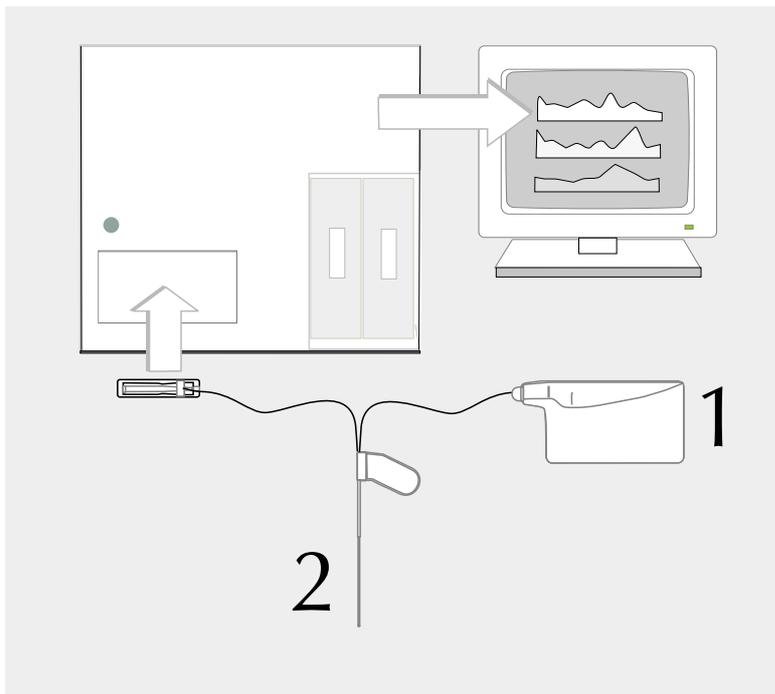
Clinical staff is expected to operate CMA 600 routinely after adequate training.

CMA 600 Microdialysis Analyzer is part of a clinical microdialysis system (Figure 1) consisting of:

1. CMA 106 and CMA 107 Microdialysis Pumps: portable and battery powered, microdialysis syringe pumps.
2. CMA 60 Microdialysis Catheter: microdialysis catheters with inlet tubing connected to the pump syringe and outlet tubing connected to a microvial for collecting the small sample volumes.

See the respective manual for more information.

*Figure 1*



1.2. Description of CMA 600 Microdialysis Analyzer

Figure 2. CMA 600 front view.

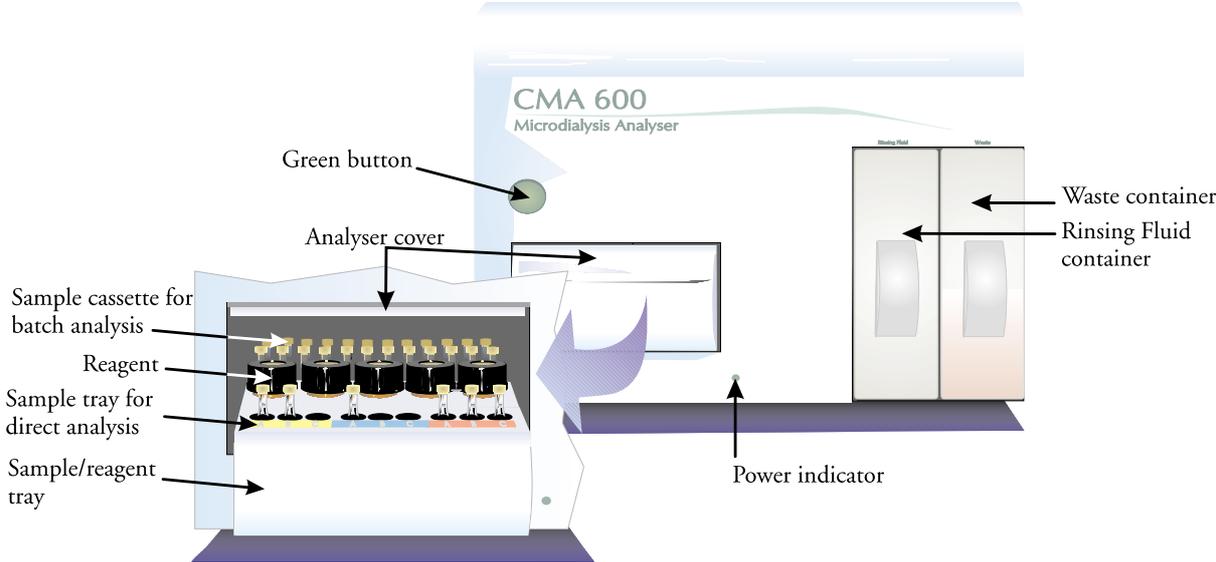


Figure 3. CMA 600 rear panel

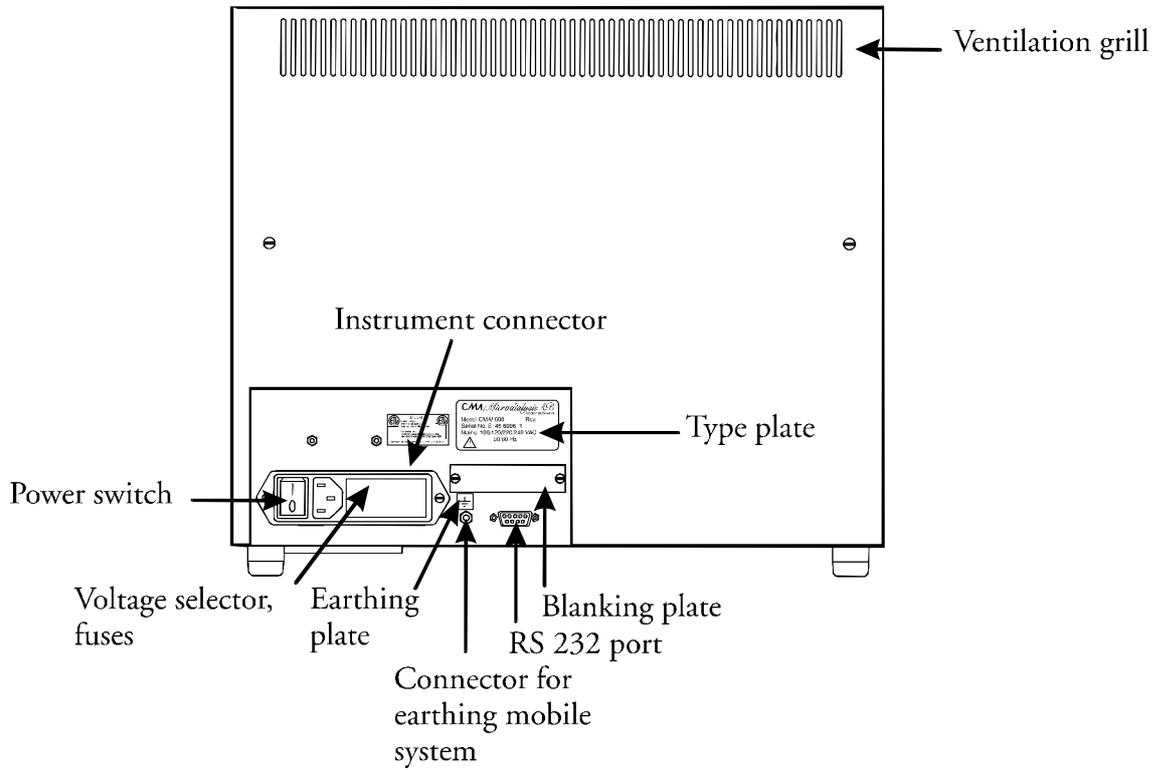


Figure 4. CMA 600 Microdialysis Analyser in a mobile system.

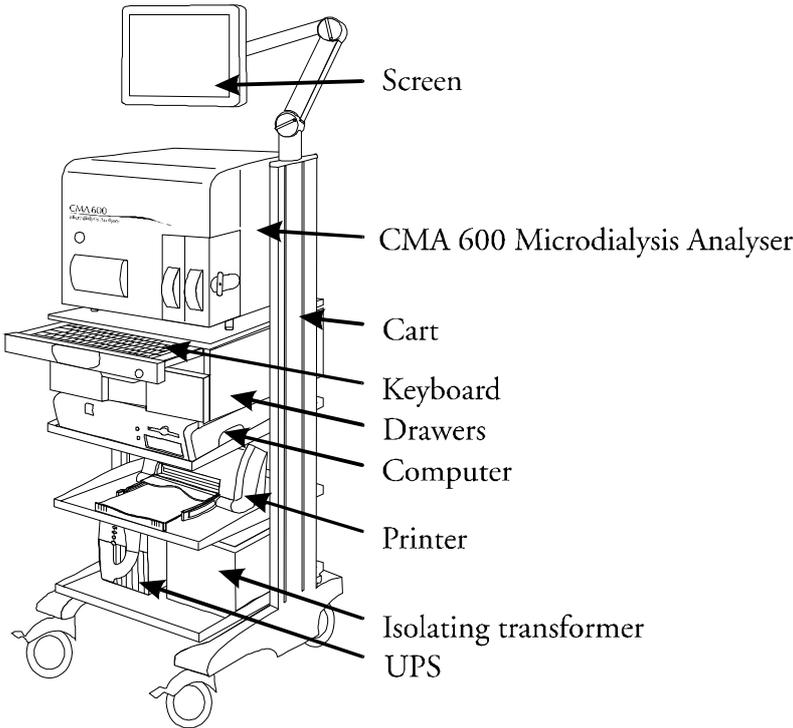
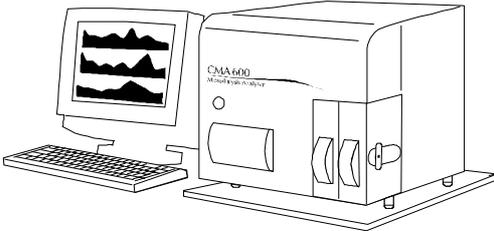


Figure 5: CMA 600 Microdialysis Analyser with computer



## **2. Safety, warranty and service**

### **2.1. Safety**

CMA is liable for the safety and reliability of its equipment only if:

- a) maintenance, modifications, and repairs are carried out by authorized personnel;
- b) components are replaced with CMA-approved spare parts;
- c) devices are used only with CMA-approved accessories and consumables; and,
- d) The devices are used in accordance with CMA's operating instructions.

### **2.2. Warranty**

CMA/Microdialysis AB (CMA) offers one year warranty, from the day of purchase, on defective material and assembly.

The warranty does not cover damage resulting from incorrect use or maintenance or from unauthorized software modification.

CMA is only responsible for replacement of defect parts, not of wear parts. CMA is not responsible for any personal injury or any damage resulting from incorrect use of the analyzer.

### **2.3. Service**

CMA recommends routine service by authorized personnel with six months interval.

Routine service includes:

- Replacing pump tubing, cannula and syringe.
- Cleaning the fluid pathway.
- Cleaning those parts of the instrument in contact with fluids, externally and internally.
- Checking lamp- and cell-house temperatures.
- General inspection of the analyzer.
- Function test.

Post warranty a service agreement may be purchased.

For more information, please contact the service department:

CMA/Microdialysis AB

Box 2

SE-171 18 Solna

Sweden

Phone: +46 8 470 10 00

Fax: +46 8 470 10 50

E-mail: [service@microdialysis.se](mailto:service@microdialysis.se)

Web: <http://www.microdialysis.se>

## **3. Installation**

### **3.1. Unpacking and installation.**

CMA service personnel or personnel designated by CMA must perform all unpacking, installation and function tests of the instrument.

When moving the Analyzer, avoid damaging the Analyzer cover.

The analyzer should be placed on a table or rack allowing 20 mm air space under the instrument. The instrument should be placed in a draught free place and not in direct sun light. For ranges of acceptable temperature and humidity, see the technical specifications.

### **3.2. EN 60601 requirements**

To fulfil the EN 60601 requirements for leakage current and electrical separation the installation must satisfy the EN 60601-1-1 standard.

## 4. Instructions for use

### 4.1. General

CMA 600 Microdialysis Analyzer is controlled by PC-software operating under Windows.

The instrument functions are represented as icons. The user runs the instrument with mouse or from the keyboard. We recommend that the user reads this manual or the on-line manual (can be found as a program icon) before operating the instrument.

### 4.2. Green button

Pressing the **green button** (Figure 2) causes the sample / reagent tray to extend. Samples can then be loaded. The green button pressed again retracts the sample / reagent tray and commences the analysis.

The green button lamp:

1. Not illuminated: The analyzer is not ready for use.
2. Illuminated: The analyzer is on and mechanically initialized.
3. Flashing: The button has been pressed.

### 4.3. Status bar

The status bar shows the current status: the person from whom samples are being analyzed, catheter, analysis phase, vial position, analyte, time and date, filter, time interval to next calibration, calibration results and an indication whether it is time to replace peristaltic pump tubing, cannula or syringe.



### 4.4. Light indication

The lights, to the right on the status bar, indicate how the latest calibrations succeeded. Clicking on any of the lights is equivalent to clicking on



(see page 10). In the information window appearing, the same lights are shown, each one above the corresponding analyte position.

Green steady light indicates that the last calibration is OK.

Green blinking light indicates an ongoing calibration.

Red steady light indicates that more than 12 hours has elapsed since the last successful calibration.

Red blinking light indicates that the last calibration was not approved.

## 4.5. Icons

### Normal menu



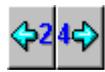
Exit from CMA 600 program.



Registration



Print data



Shift graph 24 hours



Export data to Excel file



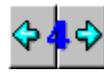
To Instrument menu



Check/Change reagents and calibrator



Analysis



Shift graph 4 hours



Shift graph to current time



Batch analysis



Help

### Instrument menu



Mechanical initialization



Extend sample/reagent tray



Show logfile



Show results for control sample



Show control graphs



Back to Normal menu



Rinse fluid pathway



Manual calibration



Analysis of control sample



Database



Utility Program. See help file for more information (click  or press F1).



Help

#### 4.6. Manual and Help (On-line manual)

1. This manual describes the most important CMA 600 software functions. More information can be found in the on-line manual, opened by pressing F1 or clicking on

*Help* or .

2. If a system message appears, click on *Help* for instructions.

#### 4.7. Starting the CMA 600.

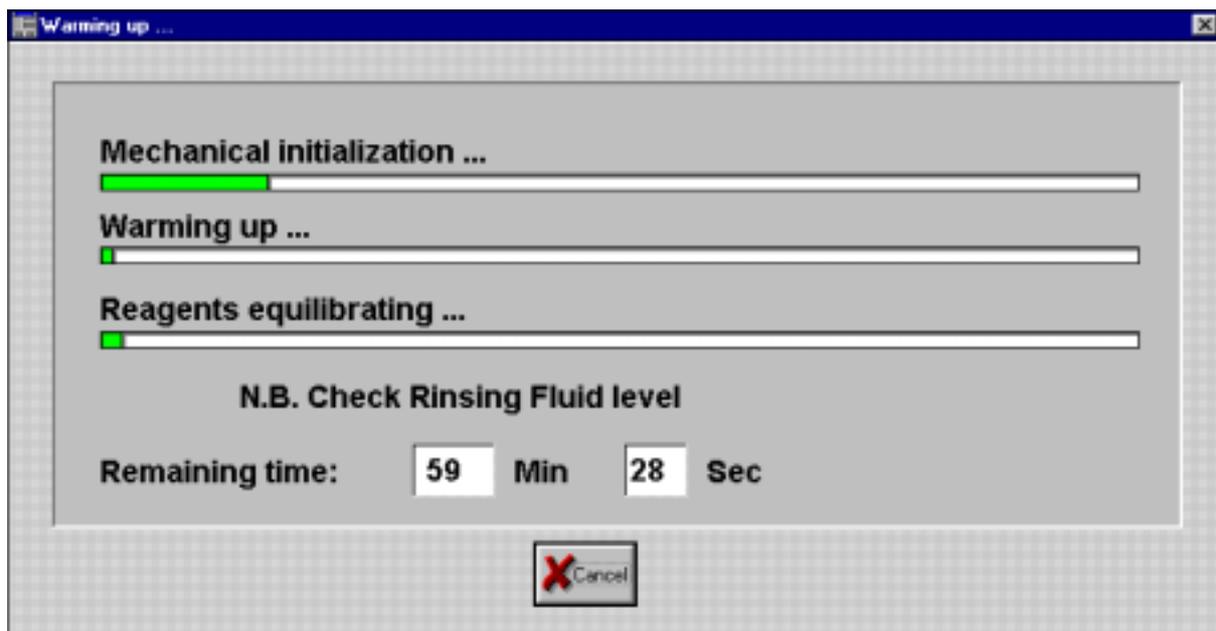
CMA 600 requires a one-hour warm-up time to reach working temperature and lamp stabilization.

1. Turn on CMA 600, computer and screen.

2. If UPS (Uninterruptable Power Supply) is installed, turn on the instrument from the UPS.

3. The following window will open:

Figure 6



4. Check that the Rinsing Fluid container is at least 2/3 filled. To fill, see section 8.2.

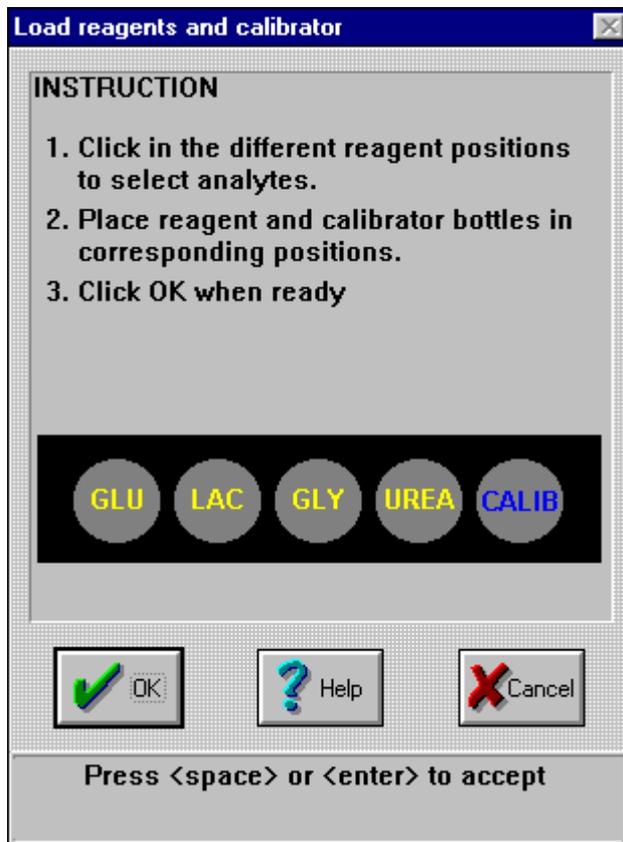
5. Check that the Waste container is filled to no more than 1/3 capacity. To empty, see section 8.2.

6. Prepare reagents (see section 4.8). Remove the rubber stopper from the calibrator bottle. The warming up sequence can be interrupted but the reagents must be prepared and equilibrated before use and the CMA 600 electro-optical system must be stabilized.

7. Wait for mechanical initialization. Check that the green button is lit.

8. After the mechanical initialization, the analysis table extends and following dialog appears (Figure 7).

Figure 7

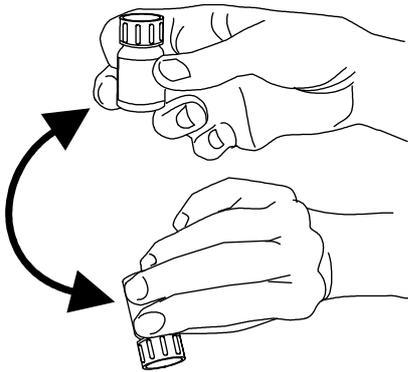


9. Click to select correct reagents, put the reagent and calibrator bottles in the CMA 600 and finish with clicking OK.
10. A calibration is made as soon as the warming up period has elapsed (the warming up window, Figure 6, is automatically closed).
11. Register a person. See section 4.11.
12. The instrument is now ready for analysis of microdialysis samples.

#### 4.8. Preparation of reagent solution

1. Unscrew the cap with the membrane from the reagent bottle. Remove and discard the rubber stopper.
2. Transfer the contents of the buffer bottle to the reagent bottle.
3. Replace the cap with the membrane on the reagent bottle.
4. Dissolve the reagent by gently turning the bottle upside-down (see Figure 8 below) at least ten times. Let the reagent stand and equilibrate in room temperature for at least 30 minutes. Turn the bottle twice upside-down before placing it in the CMA600.

Figure 8



#### 4.9. Loading reagents and calibrator

13. Prepare the reagents (see section 4.8). NB. Remove the rubber stopper from the calibrator bottle. The warming up sequence can be interrupted but the reagents must be prepared and equilibrated before use and the CMA 600 electro-optical system must be stabilized.

2. Click on *Reagents*. (Figure 9)

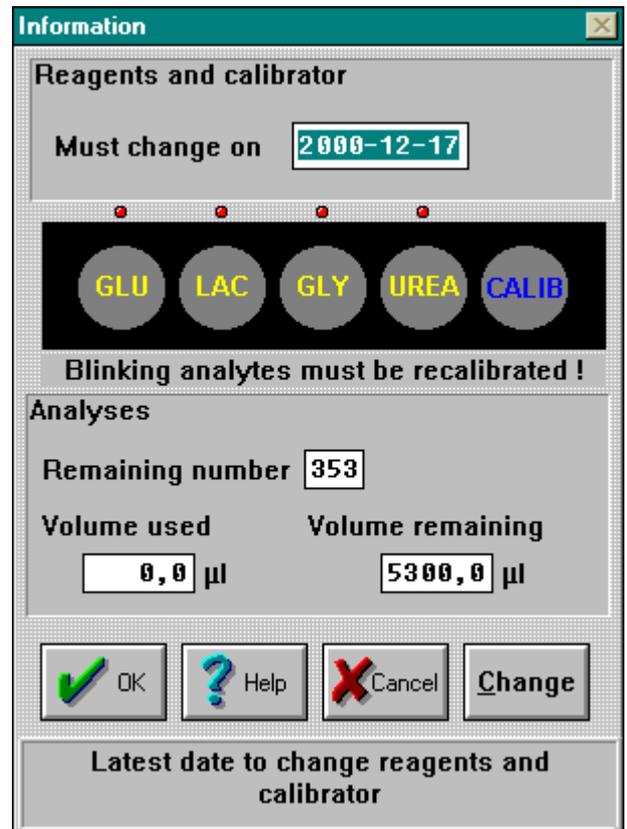
Figure 9



3. The window displays the present reagents and calibrator set-up. To change, click on *Change* (Figure 10). Click on *OK* or *Cancel* to close the information window.

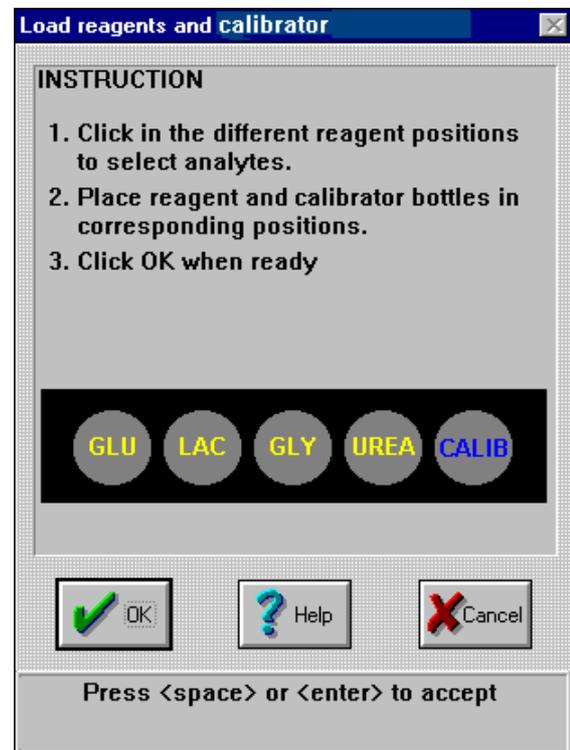
(Click *OK* to accept reagents, Click *Cancel* if automatic calibration is not wanted now, click *Change* to change reagents).

Figure 10



4. The sample/reagent tray extends. A window opens (Figure 11). Select reagents by clicking with the left mouse-button. Reagent set-up can be changed by using the right mouse button.
5. Place reagent- and calibrator-bottles on the sample/reagent tray as shown. Calibrator should always be placed in the far right position.
6. When all bottles are in the correct position, click *OK*.
7. The warming up dialogue appears. If the Rinsing Fluid container is less than 2/3 full, see section 8.2.
8. The analyzer performs an automatic calibration as soon as Reagents equilibration has been carried out and the warming up dialogue has been closed automatically. The automatic calibration takes from 5 to 15 minutes depending on the number of reagents used, followed by *Calibration ready* appearing in the status bar.
9. An Error message will appear if the calibration is not accepted. For information click *Help*.

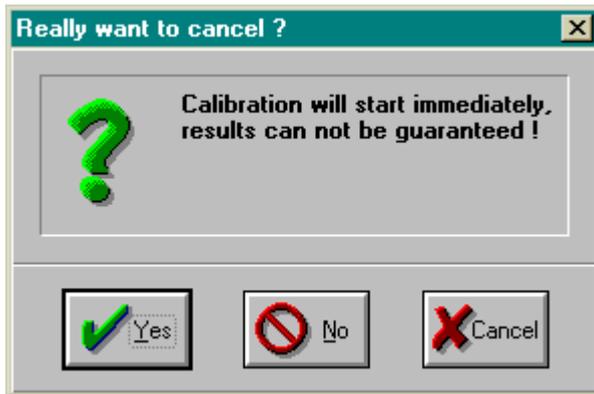
Figure 11



#### 4.10. The interruption of the Warming up dialogue

The warming up sequence can be interrupted but the reagents must be prepared earlier and equilibrated before use and the CMA 600 electro-optical system must be stabilized. Click Cancel in the Warming up dialogue and click Yes in the following dialogue that appears, (Figure 12)

*Figure 12*



## 4.11. Registration

Figure 13



1. Click on icon 1 (yellow), 2 (blue) or 3 (red) to register (see section 4.5), or click on icon for database to reregister a person from the database (see section 4.23).
2. To deregister a person for whom analysis is completed (see section 4.22).

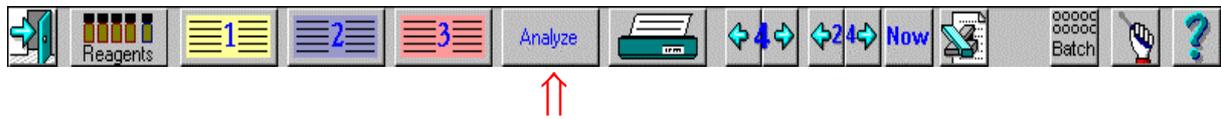
Figure 14

3. Enter family name, first name and ID in the appropriate fields. ID must be unique for each person!
4. Enter location of microdialysis catheter(s) and sampling interval.
5. Check-mark boxes for analyses to be performed.
6. When registration is completed, click *OK*.

## 4.12. Analysis of microdialysis samples

1. Push the Green button or click *Analyze*. (Figure 15)

Figure 15



2. The sample / reagent tray extends and the *Analysis* window opens with three sections, 1 (yellow), 2 (blue) or 3 (red), each with three sample positions for catheter A, B or C. (Figure 16) (For example, the third catheter for the second person would be designated 2(blue), C)

Figure 16

| Adamsson |                                     |                                     | Bailey                              |                                     |          | Davidsson                           |                                     |          |
|----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------|-------------------------------------|-------------------------------------|----------|
| 1A       | 1B                                  | 1C                                  | 2A                                  | 2B                                  | 2C       | 3A                                  | 3B                                  | 3C       |
| 07:35    | 07:35                               | 07:27                               | 07:35                               | 07:27                               | 07:27    | 07:35                               | 07:27                               | 07:27    |
| 96/11/01 | 96/11/01                            | 96/11/01                            | 96/11/01                            | 96/11/01                            | 96/11/01 | 96/11/01                            | 96/11/01                            | 96/11/01 |
| Glucose  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| Lactate  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| Glycerol | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |          |
| Urea     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |          | <input type="checkbox"/>            | <input type="checkbox"/>            |          |

3. Place the microvials in the corresponding position on the analysis tray with the narrow end of the vial upwards. Each vial to be analyzed will be indicated in white on the screen and the box below it will be check-marked.
4. An ID-number will appear below each vial. In the example from Figure 16, 1A025, 1 is for position number, A for catheter and 025 a number which is updated for each vial. Each vial analyzed is assigned a unique ID-number, which can not be changed by the user.
5. Check that sampling time and date are correct, change, if necessary, by clicking on time or date and entering the correct value. If the box "same" is check-marked, the sampling time or the date for all catheters for this person will be changed.
6. Verify analytes for each catheter and, if necessary, change by check-marking/clearing appropriate boxes.

7. Designate user vial numbers by typing the number or by clicking on the up or down arrows to the left of the user vial number. The number can be used for identification of vials provided that a unique number has been entered for each vial.
8. Press the green button again or click on *OK* to confirm that all data have been entered. The analysis begins.  
Note: The analysis will start automatically after two minutes even if no confirmation has been made.

#### 4.13. Reanalysis

If reanalyzing a sample, start as described in 4.12.1-4. Use the up or down arrow keys to select the correct vial ID.

Check that the correct user vial no. is shown. Proceed as above.

The reanalyzes will have the same vial ID but the sampling time will be increased by one minute to separate the two analyses.

Select analytes by clicking in the corresponding checkboxes.

Figure 17

The screenshot shows the 'Analysis' screen with the following fields and options:

- Analysis** (Title bar)
- Adamsson** (Name)
- Vial ID**: 1A025 (with up/down arrows)
- User vial no.**: 1A025 (with up/down arrows)
- Time**: 1A, 07:35
- Date**: 1A, 96/11/01
- Analytes**:
 

|          |                                     |
|----------|-------------------------------------|
| Glucose  | <input checked="" type="checkbox"/> |
| Lactate  | <input checked="" type="checkbox"/> |
| Glycerol | <input checked="" type="checkbox"/> |
| Urea     | <input type="checkbox"/>            |

### 4.14. Batch analysis

1. Click on *Batch analysis* (Figure 18) producing the *Batch analysis* window. (Figure 19).

Figure 18



The following window is shown

Figure 19

**Batch analysis**

Sample interval: 01:00 hh:mm

Position 6

| Name     | Catheter | Vial no. | Time  | Date     | Glucose                             | Lactate                             | Glycerol                            | Urea                                |
|----------|----------|----------|-------|----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Adamsson | 1A       | 1A006    | 13:00 | 96/11/04 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

|   | Name     | Catheter | Vial# | Time  | Date     | Glucose | Lactate | Glycerol | Urea    |
|---|----------|----------|-------|-------|----------|---------|---------|----------|---------|
| 1 | Adamsson | 1A       | 1A001 | 08:00 | 96/11/04 | Ready   | Ready   | Ready    | Ready   |
| 2 | Adamsson | 1A       | 1A002 | 09:00 | 96/11/04 | Analyze | Analyze | Analyze  | Analyze |
| 3 | Adamsson | 1A       | 1A003 | 10:00 | 96/11/04 | Analyze | Analyze | Analyze  | Analyze |
| 4 | Adamsson | 1A       | 1A004 | 11:00 | 96/11/04 | Analyze | Analyze | Analyze  | Analyze |
| 5 | Adamsson | 1A       | 1A005 | 12:00 | 96/11/04 | Analyze | Analyze | Analyze  | Analyze |
| 6 | Adamsson | 1A       | 1A006 | 13:00 | 96/11/04 | Analyze | Analyze | Analyze  | Analyze |
| 7 |          |          |       | :     | 96/11/05 | -       | -       | -        | -       |
| 8 |          |          |       | :     | 96/11/05 | -       | -       | -        | -       |
| 9 |          |          |       | :     | 96/11/05 | -       | -       | -        | -       |

OK Help Cancel Table in

Enter the time for this position [HH:MM] and press <tab>

2. Positions 1 to 24 are shown at the top: white indicates active, black inactive and gray already analyzed. Activate or deactivate by right-clicking.

3. To activate the first position, click on corresponding row in the table (or click on the first position on the diagram of the batch analysis cassette).  
Select a name from the list of registered persons.  
Choose catheter from the list  
Enter vial ID for the first vial.  
Enter time and date for sampling.  
Change analytes by clicking in appropriate box
4. By right-clicking on a vial position in the batch analysis cassette, several vials will be marked automatically. The sampling time assigned to each position is automatically incremented by the sampling interval. (If sampling interval has been changed from initial registration, before right-clicking, type new sampling interval in appropriate box).
5. Repeat steps 3 and 4 for each additional catheter and person from whom samples are to be analyzed. The first vial in any series can be placed in any free position.
6. To correct or remove already analyzed samples:
  - mark the first vial of the batch to be erased by right-clicking on the vial position to make it black
  - right-click on the last vial to be erased
7. It is also possible to edit in the table. Select the catheter and name from the drop down box above the table.
8. Select the desired analyte (s). Unless otherwise specified the analyses initially indicated will be performed. In each column A (Analyze) indicates that analysis is desired, R (ready) that it has been completed and a minus sign (-) for no analysis.
9. When all input data are correct click on *Table out* or press the **Green button**. Wait for the sample/reagent tray to extend and place the microvials in the batch analysis cassette.
10. Start analysis by clicking *OK* (or press the **Green button**).

#### 4.15. Record events

Figure 20



1. Method 1. Select 1 (yellow), 2 (blue) or 3 (red). (Figure 20)  
Click on *Events* (Figure 14) and a new window opens.  
Method 2. Right-click on the name in the graph.
2. Click on *New* and another window opens. Enter event and time and sign.  
Click *OK* in both windows.

#### 4.16. Remove or change an event

1. Right-click on the name in the head of the graph and a window opens. Click on the event to be erased or edited.
2. Remove: Click on *Remove* and *OK*.
3. Edit: Click on *Edit* and another window opens. Enter changes. Click *OK* in both windows.

#### 4.17. Edit data

1. Right-click on the analyte in the graph where data is to be edited.
2. In the window that opens, click on the row where data is to be edited. Click on *Edit*.
3. Date, time and vial-ID can be changed in the next window. A sample can also be marked as missing. Such a sample will not be shown in graphs and in printouts it will be shown as missing.

#### 4.18. Exchange of reagent and calibrator

1. *Reagent too old or empty* appears when there is time too change reagents.  
Note: All reagents and calibrator must be exchanged at the same time.
2. Click on *Reagents*. (Figure 21)

Figure 21



3. A window opens showing remaining reagent volumes and number of samples for which the remaining reagent will suffice. (See Figure 10)
4. To load new reagents and calibrator, see section 4.9.

#### 4.19. Editing graphs on the screen

This table describes how graphs are edited. More information can be found in the electronic manual, see section 4.6 and *Help*.

| <b>Change</b>           | <b>Mouse-position</b>                  | <b>Mouse-button</b>                          | <b>Result</b>   |
|-------------------------|--|--|---|
| Change of presentation  | Head of graph                          | Left<br>(circulating with repeated clicking) | Three alternatives where one or three persons are presented for one or three days |
| Change of catheter      | Text catheter A, B, C in head of graph | Left   | Browse among registered catheters with analyzed samples                           |
| Increase Y-scale        | Upper arrow                            | Right  | Stepwise increase of Y-scale  |
| Decrease of Y-scale     | Upper arrow                            | Left   | Stepwise decrease of Y-scale  |
| Change of Y-scale       | Text Y-scale                           | Left   | A window opens. Change interval, click OK.  |
| Increase Y-offset       | Lower arrow<br>or<br>Text Y-scale      | Right  | Stepwise increase of the value for time axis to cross Y-axis.                     |
| Decrease Y-offset       | Lower arrow                            | Left   | Stepwise decrease of the value for time axis to cross Y-axis.                     |
|                         | Text time-scale                        | Right  |   |
| Y-offset back to 0      | In graph                               | Right  | Offset returns to 0   |
| Zooming an analyte      | In graph                               | Left   | Graph is zoomed to cover the entire screen  |
| Zoom back to default    | In graph                               | Left   | Graph back to normal size   |
| Change of date interval | Date interval in head of graph         | Left   | To display graph including first data point                                       |
|                         |  | Right  | To display graph including last data point  |
| Copy of graphs          | Name in head of graph                  | Left   | Data on the screen are copied   |
| To edit data            | Analyte                                | Right  | Change date, time or mark missing sample  |

## 4.20. Printing

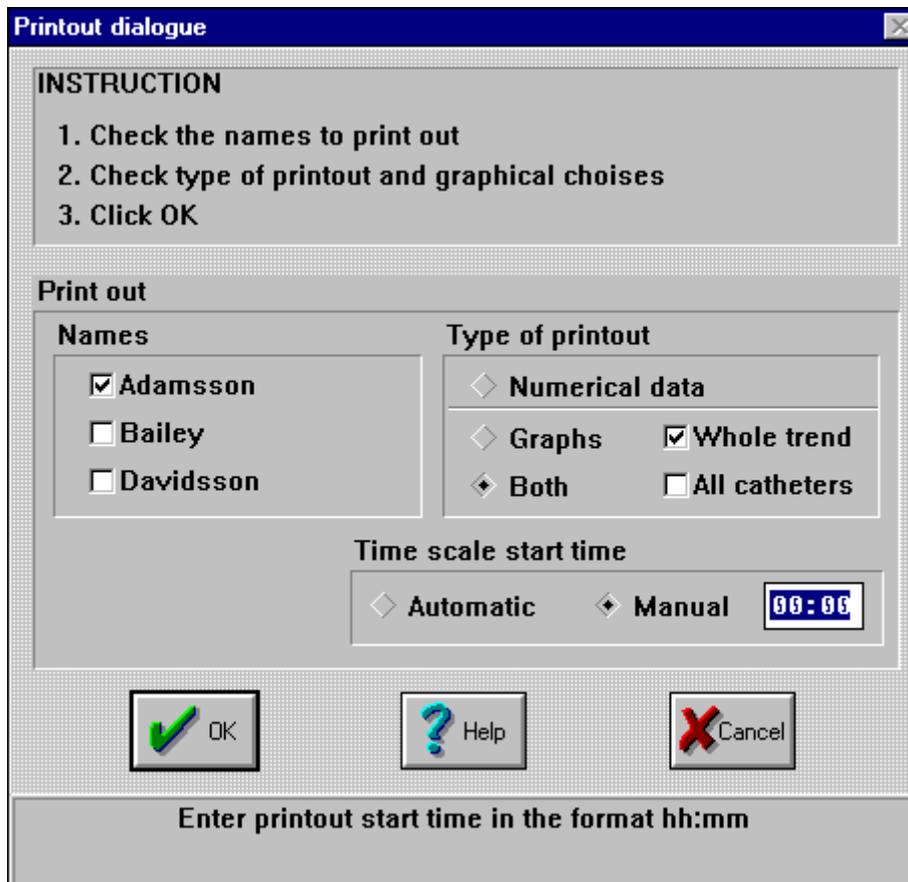
1. Click on *Printer*. (Figure 22)

Figure 22



2. A window is opened (Figure 23). Click on the name of the person for whom data are to be printed and select the desired data.
3. "Numerical data" gives a list of all results for selected persons.
4. By check marking the box "Whole trend" all graphs for the selected catheter will be printed. By check marking "All catheters" graphs for catheters not shown on the screen will also be printed.
5. If the entire graph is marked, starting time for graph printout can be chosen.
6. Automatic - the program selects a suitable starting time
7. Manual - insert desired start time
8. Click *OK* to start print out.

Figure 23



#### 4.21. Preview of data

1. Click on the register icon for the person whose data is to be shown according to point 4.11 on page 17.
2. Click on the magnifying glass (as shown in the dialogue in Figure 14 on page 17) and data will be shown on the screen.

#### 4.22. Deregister a person

After deregistering a person, data for this person is no longer available on the screen. (Such data can be retrieved from the database.)

1. Click on 1, 2 or 3 to select person to be deregistered (See Figure 13 on page 17).



2. A window opens (Figure 14 on page 17), click on , another window opens showing the person to be deregistered. Check that person ID corresponds. Click on OK to deregister.

#### 4.23. Database

Data already analyzed can be retrieved, by using the database function. Using the database function it is possible to reregister a person and in this way be able to show or print "old" data and also make new analyses for that person.

1. Make sure that at least one of the register positions is free, i.e. not more than two persons are registered.

2. Select the Instrument menu by clicking on .

3. Click on the database icon , the database dialogue is shown.

4. Follow the instructions on the screen to reregister a person, i.e. double click on the person to register. NB only data for persons that are not registered are shown in this dialogue.

In this dialogue it is also possible to erase data and copy data to or from diskette.

#### 4.24. More than four analytes

To run more than four analytes the person must be registered twice. I.e. two different person ID:s must be used, as one person ID cannot contain more than four analytes.

1. Run the first analytes as usual and save the Microvials (in the freezer if necessary).
2. When the analyses are ready, change reagent setup and let calibrate.
3. Register a new person with the new reagent setup.
4. Analyze all vials using batch analysis and remember the user vial number.

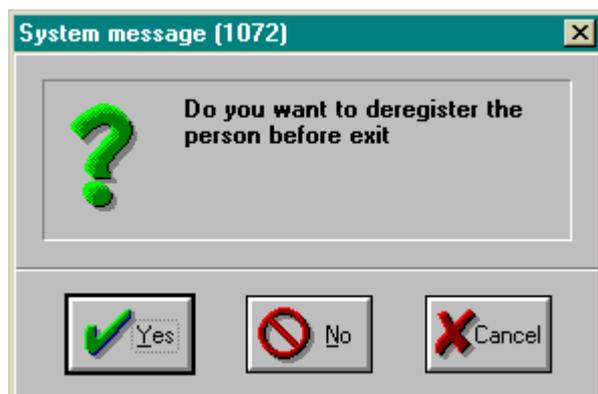
#### 4.25. Shut down of CMA 600

1. Click on .
2. A window opens with the question: *Really want to exit?* Click *Yes*. (Figure 24).

Figure 24



Figure 25



3. The dialogue above (Figure 25) will appear if there is at least one person registered upon exiting. Click *Yes* if you want to deregister the person(s) before exiting the CMA 600 program. If you don't want to deregister before exiting, click *No* and the persons will stay registered. The next time you start CMA 600 the registrations remain in the same positions as before exiting the program.
4. The sample/reagent tray will extend. Reagents, calibrator and microvials can be removed. When this is done, click *OK*.
5. The CMA 600 program is now closed. Exit from Windows. Turn off the CMA 600, computer and screen. If UPS is installed, the UPS power switch turns off the entire system.

#### 4.26. Emergency stop

If an activated command must be interrupted, press F2. A window opens with the question: *Really want to stop?* Click *Yes* and the system stops.

## 5. Calibration

The analyzer will automatically perform calibration every 6 hours. Manual calibration is also possible at any time. Click on *Manual calibration* (section 4.5).

## 6. Analysis of control samples

Click on *Analyze Control samples* and follow the instructions on the screen. When the control samples are analyzed, click on *View Control samples* and note the results (section 4.5).

## 7. Sample Handling (Frozen samples)

Frozen samples should be thawed in an incubator, not in a water bath, at 40 -50° C for maximum 10 minutes to reduce the risk for formation of air bubbles in the samples.

The tubes are centrifuged 10 - 15 seconds at 2000 g. During centrifugation the vial has to be placed so that it rests on the small stopper and not on the rim of the vial, otherwise there is a risk that the small stopper is pushed out of the vial.

The assays should be performed as soon as possible before cooling to room temperature.

The tubes ought not to be refrozen after analysis if the volume is < 15 µL.

Evaporation during freezing and thawing affects the volume which gives elevated values, up to 5% at small volumes (< 15 µL).

## 8. Routine maintenance

### 8.1. Cleaning the instrument

Wipe the outside of the instrument with disinfectant (70% ethanol or equivalent).

### 8.2. Addition and emptying of rinsing fluid.

*Check / Fill Rinsing Fluid and press OK* indicates an empty Rinsing Fluid container. It is advisable to add Rinsing Fluid before the bottle is empty, as this otherwise could interrupt analysis. The level of the fluid is easily seen through the container.

The Rinsing fluid should be kept at room temperature and be at room temperature when added.

Addition: (If a mobile system is used, push in the keyboard). Pull the fluid container straight out until there is a stop and the filling hole is seen. Add Rinsing fluid to the upper mark on the left side of the container. Return the container to its original position.

Emptying: Emptying of the waste container should be done at the same time as Rinsing fluid is added. Turn the handle on the right side of the waste container to its horizontal position. Pull the waste container out until the handle reaches the hole in the container. Lift the container sideways out of the analyzer. Empty the container and flush with plenty of water. Return and lock the container in its original position. Don't remove the Rinsing fluid container, as it is connected by tubes to the analyzer.

## 9. Trouble shooting

See section 4.6, Manual and *Help*.

## 10. Classification and Regulations

CMA 600 Microdialysis Analyzer meets international standard EN 60601-1:

Paragraph 5.1: "CLASS I EQUIPMENT"

Paragraph 5.3: "Ordinary EQUIPMENT"

Paragraph 5.4: Disinfection: the outside of the instrument is cleaned with disinfectant (70% ethanol or equivalent).

Paragraph 5.5: "Equipment not suitable for use in the presence of a FLAMMABLE ANAESTHETIC MIXTURE WITH AIR OR WITH OXYGEN OR NITROUS OXIDE".

Paragraph 5.6 "CONTINUOUS OPERATION"

CMA 600 Microdialysis Analyzer meets international standard EN 61010 class II.

The CMA 600 Microdialysis Analyzer bears the CE label in accordance with the provisions of the European Directives for LVD (Low Voltage, 73/23/EEC and 93/68/EEC) and EMC (89/336/EEC, 92/31/EEC and 93/68/EEC) and IVDD (98/79/EC).

The CMA 600 Microdialysis Analyzer is ETL listed according to UL No 2601-1 and CAN/CSA-C22.2 No. 601.1-M90.  
UL No 3101-1 and CAN/CSA-C22.2 No. 1010.1-92.

## 11. Technical specifications

### 11.1. Technical data

|                         |   |
|-------------------------|---|
| Voltage                 | 100 / 120 / 220 / 240 VAC 50 / 60 Hz  |
| Power consumption:      | 100 VA  |
| Fuses:                  | 220/240VAC - 2 x T2.5AL<br>110/120 VAC - 1 x T6.3A 6.3 x 32 mm, CSA and UL approved |
| Power cord:             | For USA/Canada - UL544 "Green dot" Hospital grade power cord.                       |
| Dimensions W x D x H:   | 393 mm x 445 mm x 345 mm  |
| Weight:                 | 23 kg   |
| Principle:              | Kinetic enzymatic analyzer  |
| Samples:                | Microdialysates   |
| Sample vials:           | Microvial   |
| Sample volume, used:    | ≤ 1.0 µL/analysis (typical 0.5 µL/analysis, depending on analyte and conc.)         |
| Minimum sample volume:  | Sum of sample volumes per analyte + 2.0 µL  |
| Reagent consumption:    | ≤ 15 µL / analysis (depending on analyte and conc.)                                 |
| Imprecision:            | ≤ 5 % RSD (depending on analyte and conc.)  |
| Calibration:            | Automatic (manual possible)   |
| Warm-up time:           | 60 minutes  |
| Measuring time:         | 30 sec  |
| Throughput time / test: | 60 - 90 sec   |
| Detector:               | Single beam filter photometer   |
| Light source:           | Hg-lamp   |
| Wavelengths:            | 365 and 546 nm  |
| Detector cell:          | Capillary flow cell 10 mm, 2 µL   |
| Reaction temperature:   | 37° C   |

CMA Microdialysis AB reserves the right to make changes in the specifications without prior notice.

## 11.2. Operating environment

- The analyzer is manufactured for indoor use and should be placed in a draught free place and not in direct sunlight.
- No radio transmitters, cellular phones or other wireless communication devices should be used in the vicinity of the analyzer.
- The analyzer should not be submitted to higher levels of disturbance as specified in EN 60601-1-2 and EN 61010.

### Transport and storage

Temperature at transport: -40 to +70 °C. NB. If transportation is done at a temperature at or below 0 °C the CMA 600 liquid system must be empty of any liquid.

Temperature at storage: +5 to +45 °C.

Relative humidity at transport and storage: 10% to 100% RH, non-condensing.

Atmospheric pressure: 50 till 106 kPa.

### Operation

Ambient temperature: +18 to +28 °C.

Relative humidity: 30% to 75%.

Atmospheric pressure: 70 to 106 kPa.

Voltage variation: Max.  $\pm 10\%$  of nominal voltage.

## 12. Text and symbol explanation

**Rinsing Fluid**

Marks place for Rinsing Fluid container. (Figure 2)

**Waste**

Marks place for Waste container. (Figure 2)



User must consult user manual before handling.



Functional earth for mobile system



The product meets EU directives for EMC, LVD and IVDD.  
(See page 29).

**Before June 30 2004**

The product is ETL listed. (See page 29)



**After July 1 2004**

The product is ETL listed. (See page 29)



## **13. Consumables, Options and Spare Parts**

For current information, please visit our website:

<http://www.microdialysis.com>

## **14. Catheters, pumps and accessories**

For current information, please visit our website:

<http://www.microdialysis.com>

## **15. Disposal of consumables and accessories**

1. Disposal of reagents and calibrator: See reagent manual regarding the disposal of reagents and calibrator.
2. Disposal of Rinsing Fluid: See section 8.2.
3. Microvials can be treated as normal waste unless there is risk for infection.
4. For disposal of the CMA 600 Analyzer, or parts thereof, contact CMA / Microdialysis for more information