LAURA® M

Urine Analyzer

BLUE POINT OF QUALITY

User´s guide

LAURA® M

Contents

1. Introduction

Urine analyzer LAURA M is a reflectance photometer for semi-quantitative urine analysis using test strips PHAN® LAURA/Uro-dip. Urine analyzer LAURA M is designed for use in laboratories of clinical biochemistry. User only dips the test strip into the urine sample and places it in the insert area. The next steps – movement, timing and measurement – are done automatically by the urine analyzer.

Major features of urine analyzer LAURA M:

- High throughput – 600 measurements / hour
- Memory capacity – last 2000 measurements (sorted by measurement date)
- Sleek, ergonomic design
- White LED (light source) – high signal / noise ratio; longer life
- RGB measurement principle
- Direct power cord
- "Flash memory" – measurement data are stored in parallel with the ongoing measurement
- Easy operation
- Possibility of SW update – via connecting the analyzer to PC (parallel ports)
- Infra-red sensor for detection of strips inserted on the feeder
- Sophisticated monitoring of strip position (ongoing measurement is not broken when an error message appears)
- Waste container for collection of used test strip with Waste full indication)
- Removable cover protects the urine analyzer from excess of fluid (elimination of contamination)

Symbols in User Manual:


Biohazard!


Danger of electric shock!


Warning! Handle with care!


Protective ground terminal.

IVD In vitro diagnostic unit.

2.1 Intended Use

The system consists of urine analyzer LAURA M and test strips PHAN® LAURA and Uro-dip strips is designed for semi-quantitative urine analysis.

Urine analyzer LAURA M can be used in medical facilities of any type and level.

Before use check the colouring of the test zones. Do not use test strips with abnormal colouring of the test zones. Check the expiry date of test strips. Do not use the expired test strips.

Operate the analyzer as instructed in User Manual. Not following the operating instructions may lead to instrument damage.

2.2 Technical Parameters

Specification	Technical parameters
Measurement principle	Reflectance photometer evaluates the colour intensity of each test zone. The intensity is then used for calculation of concentration for each analyte (semi-quantitative value).
Wavelengths	470nm; 525nm; 625nm
Throughput	600 samples / hour
Equipment	Touch screen, Colour LCD display (320x240 dot-matrix) Built-in thermal printer Option for connecting External printer
Operation	Through LCD touch screen
Memory capacity	Last 2000 measurements
External ports	RS 232 (connection with PC) External printer (25 pin port)
Power source	AC100 - 240V / 50 - 60 Hz
Power consumption	≤ 45 W
Dimensions	390 x 330 x 210 mm
Weight	6 kg

Table 2-1

Specifications subject to change without prior notice!

3.1 Unpacking

Unpack carefully the urine analyzer and its accessories from the transport box. Check that your package contains all the parts listed below and all of them are in good condition. Contact the authorized distributor or the supplier immediately if the urine analyzer is damaged or contents are missing.

List of parts is given in table 3-1:

Item	Qty (Nos)
Laura M analyzer	1
User manual	1
Thermo paper roll	1
Power cord	1
Serial cable	1
Fuse	2

Table 3-1

3.2 Urine Analyzer Description

Figure 3.1

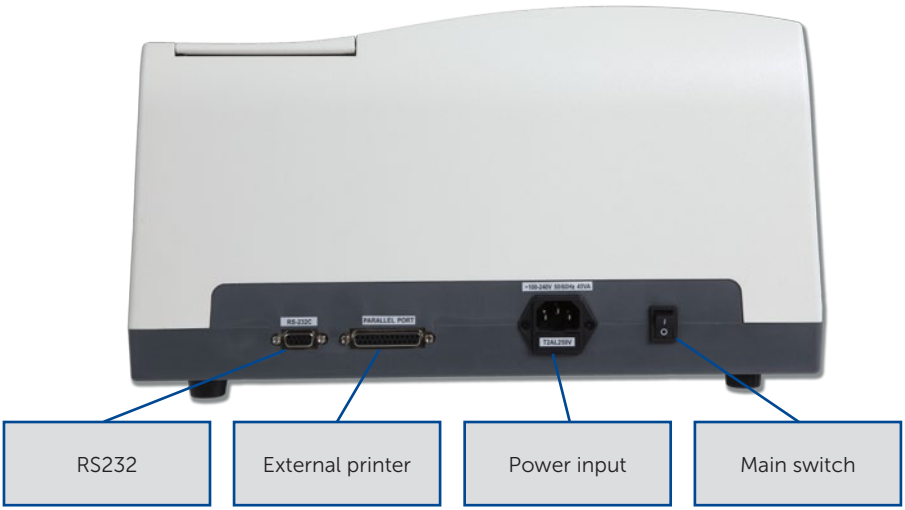


Figure 3.2

3.3 Working Environment

Requirements for working environment (table 3-2):

Parameter	Specification
Temperature	10 – 30°C
Humidity	≤ 75%
Atmospheric pressure	76 – 106 kPa
Working area	Free from intense light source, free from electromagnetic interference. Use, grounded electrical outlet only

Table 3-2

To ensure safe operation and proper functioning of urine analyzer, it must be connected using the power cord provided only into a grounded electrical outlet. Connecting another cable (dual without earthing) is strictly prohibited.

Urine analyzer LAURA M is designed for professional use in laboratories of clinical biochemistry. Opening the covers is strictly prohibited. All components of the analyser can be controlled only by the producer.

Urine analyzer LAURA M must be installed in such a way so as to allow emergency shutdown or disconnection of the power cord.

Not following the instructions given in User Manual may lead to instrument damage.

Place the urine analyzer LAURA M on a fixed desktop, the rest of this desktop will be used as working place. If any of the four legs of the urine analyzer will not touch the desktop, adjusting the upper left set screw shown in the picture below as needed will ensure sufficient stability of the urine analyzer.

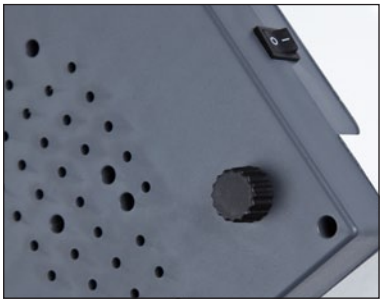


Figure 3.3

Do not operate the urine analyzer LAURA M in following environments:

- in direct sunlight
- close to flammable or explosive fumes
- close to heater or refrigerator
- close to intense light sources
- close to electromagnetic fields

3.4 Switch ON

Connect the power cord and turn the main switch to position "I". The urine analyzer starts the operation and the logo appears on the screen (figure 3.4).

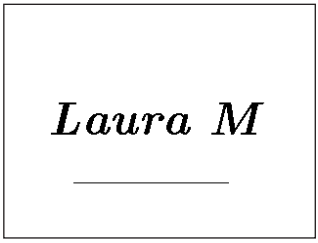


Figure 3.4

After performing the self-test and calibration the urine analyzer goes to standby mode (figure 3.5).

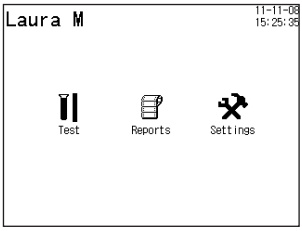


Figure 3.5

3.5 Printer – Paper Replacement

1) Push the printer cover and open it. Carefully take out the black rubber roller (figure 3.6).

Figure 3.6

2) Unpack a new roll of thermo paper. It was shipped together with the urine analyzer LAURA M.
3) Remove the roll from the covering and place it into printer (pull out 8 - 10 cm of the paper), place back the black rubber roller. The roller ensures the right position of paper during printing (figure 3.7).

Figure 3.7

4) Stretch the free end of paper across the cover. Then close the cover carefully (figure 3.8).

Figure 3.8

Install the roll of paper very carefully. Wrongly installed roll can cause the improper printing or can lead to jamming of paper.

3.6 Switch OFF

Before switch OFF, make sure there are no test strips on the transport belt (use ESC button to finish the in progress measurements). Switch the urine analyzer off when all test strips have been measured

Switch the main switch to position "0". The operation is finished and the urine analyzer LAURA M is switched OFF.

Figure 3.9

The default settings for urine analyzer LAURA M were predefined by the producer. The user can start the measurement with default settings immediately or he can modify the settings in compliance with his requirements. The modification of settings parameters can be done in an easy way.

Click on Settings in main menu (figure 3.5), following menu appears (figure 4.1).

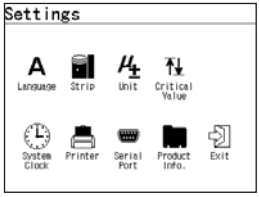


Figure 4.1

4.1 Test Strip

To display the next menu click on "Strip". In this screen you can select the type of test strips (figure 4.2).

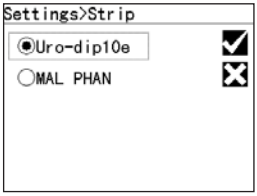


Figure 4.2

Select the required type of test strips (radio button) and click on ☑ to save the selection. Click on ☒ to return to Settings menu (figure 4.1).

Urine analyzer LAURA M supports more than only one type of test strips (different number of parameters). Before measurement make sure that type of test strips set in the urine analyzer corresponds to actual measured strip.

4.2 Units

The software of urine analyzer LAURA M can perform the evaluation of test strips in SI units, conventional units or arbitrary units. Click on "μ± Unit" in Settings menu and select the required units (the same units are used for all test zones of the test strip) – figure 4.3:

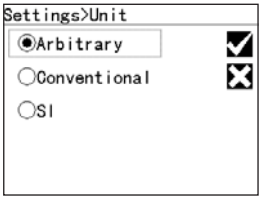


Figure 4.3

Select the required units (radio button) and click on ☑ to save the selection. Click on ☒ to return to Settings menu (figure 4.1).

4.2.1 Parameter table

Parameter	CONV		SI		ARB
	value	unit	value	unit	value
BLD	NEG	Ery/µl	NEG	Ery/µl	NEG
	10		10		1+
	50		50		2+
	250		250		3+
LEU	NEG	Leu/µl	NEG	Leu/µl	NEG
	25		25		1+
	75		75		2+
	500		500		3+
BIL	NEG	mg/dl	NEG	µmol/l	NEG
	1		17		1+
	3		51		2+
	6		103		3+
UBG	NORM	mg/dl	NORM	µmol/l	NORM
	1		17		1+
	3		51		2+
	6		102		3+
	12		203		4+
KET	NEG	mg/dl	NEG	mmol/l	NEG
	16		1,5		1+
	52		5		2+
	156		15		3+
GLU	NORM	mg/dl	NORM	mmol/l	NORM
	50		2,8		1+
	100		5,5		2+
	300		17		3+
	1000		55		4+
PRO	NEG	mg/dl	NEG	g/l	NEG
	30		0,3		1+
	100		1		2+
	500		5		3+
pH	≤6				
	7				
	8				
	9				
NIT	NEG				
	POS				
SG	1,000				
	1,005				
	1,010				
	1,015				
	1,020				
	1,025				
	1,030				
CRE	0,1	g/l	0,9	mmol/l	
	0,25		2,2		
	1		8,8		
	2		17,7		
	> 3		> 26,5		
MA	10	mg/l	0,01	g/l	
	30		0,03		
	80		0,08		
	150		0,15		
	300		0,3		
	1000		1		
	5000		5		

4.3 Critical Values

Click on "Critical Values" in Settings menu. The displayed screen enables to set so called critical value for each parameter (figure 4.4).

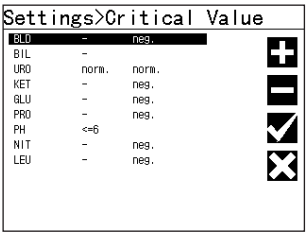


Figure 4.4

The table shows all parameters of selected type of test strips and corresponding critical values. The values can be modified in compliance with the requirements of laboratory. Select the parameter. Clicking on ✚ will increase the value, clicking on ▬ will decrease the value. Click on ☑ to save the critical values. Click on ☒ to return to Settings menu.

If the measured value for the parameter is above the set critical value, the result will be displayed or printed with "*" sign.

4.4 Date / Time Setting

Click on "System Clock" in Settings menu. The window opens in which you can set the time and date (figure 4.5):

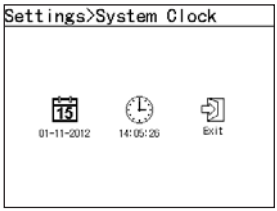


Figure 4.5

Click on to set the new date. The date can be set in format yy-mm-dd. Use the numeric keys for setting the new date. Click on to save the correct date (figure 4.6).

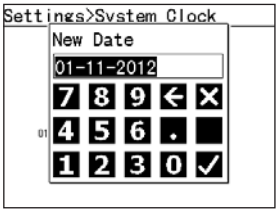


Figure 4.6

Click on to set the time. The time can be set in format hh-mm-ss. Use the numeric keys for setting the new time. Click on to save the correct time (figure 4.7).

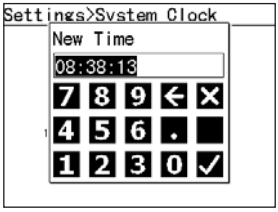


Figure 4.7

4.5 Language setting

The user can select in this menu the language, which want to communicate with the instrument. The selection can be performed using the corresponding button. OK button must be pressed to make the selection valid (figure 4.8).

Figure 4.8

The following languages are available: English, Russian, Spanish and French.

4.6 Printer

Click on "Printer" in Settings menu. Now you can set the parameters of printer and the parameters of printing (figure 4.9).

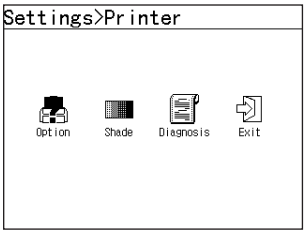


Figure 4.9

The setting of printer specifies if the printing of results is done parallel with the ongoing measurement. This setting is valid for both printers – built-in and external.

Click on "Option" in Printer menu. Here you have the possibility to switch the printer on or switch it off (figure 4.10).

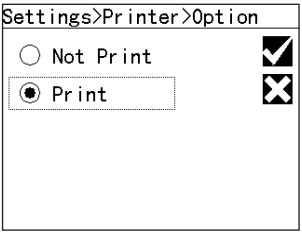


Figure 4.10

Select the option "Print" or "Not print" (radio button) and click on ☑ to save the selection.

In "Shade" menu you can set the intensity of printing for built-in printer.

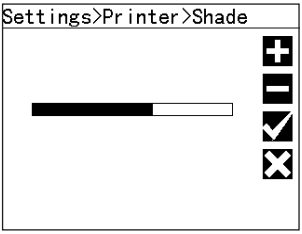


Figure 4.11

There are 21 levels of printing intensity. Black and white strip in developing zone corresponds with the shade. The shade is directly proportional to the length of black strip. Click on ✚ to increase the intensity of the shade, click on ▬ to decrease the intensity of the shade. Click on ☑ to save the intensity of the shade (figure 4.11).

The high intensity of printing has a negative impact on printing speed (decreasing) and also reduces the time life of the printer. The shade must be sufficient to ensure good readability of the results. Too high intensity of printing is not necessary. The intensity of printing is also influenced by ambient temperature. In warmer rooms it is possible to reduce the intensity, in cooler rooms is recommended to increase the intensity.
In connection with setting the corresponding intensity it is possible to use the function "print test". Test point is printed for verifying the set shade.

4.7 Serial Port

Click on "Parallel Port" in Settings menu. Now you can select the baud rate (communication between urine analyzer LAURA M and host computer) – figure 4.12.

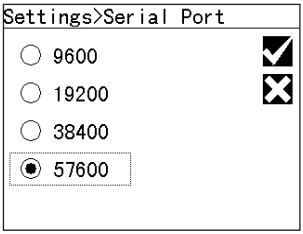


Figure 4.12

Window "Serial port" enables the user to set the baud rate between urine analyzer LAURA M (serial port on the back side of urine analyzer) and host computer (LIS). There are four options: 9600, 19200, 38400 and 57600. Select one option and click on ☑ to save the selection and return to Settings menu (figure 4.1).

4.8 Product Information

Click on "Product Info" in Settings menu. The general information about urine analyzer LAURA M appears (model, SW version etc.).

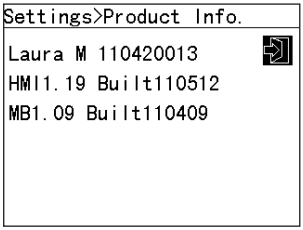


Figure 4.13

5.1 Collection of Urine Sample

Collect the urine sample into a clean container. Be sure there are no residues of cleaning solutions or detergent on the walls. Do not use the urine sample standing more than 4 hours. Use of long standing can cause the growth of bacteria, change of pH etc. Dark coloured urines may affect the analytical result (in these cases, we recommend to make a visual measurement). These conditions can lead to erroneous results of measurement.

Use the test strips PHAN® LAURA/Uro-dip as instructed in User Manual.

5.2 Measurement

Click on the button "Test" in main menu (figure 3.5). First you are asked to enter the sequence number. Enter the sequence number (use the displayed keyboard – figure 5.1) and click on ☑ to confirm it. The measurement of urine samples can start.

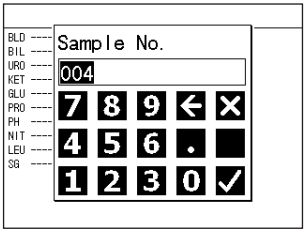


Figure 5.1

The reader first checks the daily results and automatically offers the new sequence number – this sequence number corresponds to the last measurement sequence number increased by one. Click on ☑ to continue. If you want to enter different sequence number use the keyboard. Enter the new number and click on ☑ to confirm it.

After entering the sequence number the testing window will open (figure 5.2).

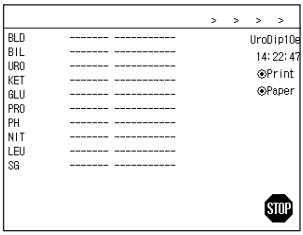


Figure 5.2

The upper right corner of screen shows information about current run of diagnostic strips. Below this information is displayed the type of test strip, the current time, the printing options and information about paper in thermal printer.

Take a new test strip and dip it into the urine sample. Be sure that all test zones are dipped. Remove excess urine from the test strip – push the edge of the strip to an absorbent paper, follow instruction for the test strips PHAN® LAURA/Uro-dip.

Place the test strip on the insert area as shows figure 5.3. Acoustic signal – beep – confirms the placement of a new test strip on the feeder. The measurement starts.

Figure 5.3

The test zones must be side-up.
Each test strip must be placed vertical between the first and second pin of the feeder.

The steps of the measurement process:

1) Place the dipped strip on the feeder as shown when the green LED is flashing

2) Measurement starts – confirmation by acoustic signal and LED turns to red

3) Transport system moves the strip inside the urine analyzer

4) The evaluation is done within 60 seconds

5) The data are printed by built-in thermo printer (or sent to host computer) depending on the settings

6) The next strip can be placed when the blinking light turns to green from red

Built-in strip detector recognizes the presence of the test strip on the transport belt. Urine analyzer starts with the measurement of the test strip only after this identification. If the test strip is not present on the transport belt the measurement will be stopped.

After dipping the test strip into the urine sample and subsequent drying of urine excess the measurement cycle can start. The strip placed on the transport belt moves to the right and the starting position is free for the next strip. Missed position (empty position on transport belt) does not influence the results or the sequence number of the analyzed sample. The sequence numbers are assigned only for the recognized test strips.

Do not place the strip on the feeder at the time when the transport belt is moving and the red LED is blinking.

The test results are displayed on the screen of urine analyzer LAURA M. As the printer is activated the results are printed parallel (the same conditions are valid for both printer- built-in printer and external printer). The data are stored in the memory. In the case of power supply failure the data are not lost. The user can recall the data from the memory at any time.

5.3 Notice

- Make sure that the test strips you use for measurement correspond with the setting. Make sure that the test strips are not expired. This can lead to erroneous results.
- After dipping the strip into the urine sample and subsequent drying it is necessary to place the strip on the transport belt immediately. Not doing so may extend the evaluation time, which may affect the accuracy and correctness of the result.
- Carefully remove the excess of urine sample from test strip to eliminate cross contamination.
- Do not handle the test strip feeder or waste container during the measurement.
- After each finished measurement cycle wash the test strip feeder and waste container.

It is not necessary to switch off the urine analyzer after each measurement cycle if you are expecting the next run of samples

5.4 Messages

In the case feeder is handled during the measurement cycle the message "Feed Table Improperly Installed" appears on the screen. After adjustment to the right position all strips that were already on the feeder are displaced from the transport belt to the waste container. It is necessary to repeat the measurement of these samples once more with new strips in the next measurement cycle.

In the case that waste container is handled during the measurement cycle the message "Waste Box Improperly Installed" appears on the screen. If the container is positioned within 5 seconds the measurement cycle continues. If the time for positioning is longer than 5 seconds, the measurement cycle breaks and the movement of the transport belt stops. After adjustment to the right position all strips that were already on the feeder are displaced from the transport belt to the waste container. It is necessary to repeat the measurement of these samples once more with new strips in the next measurement cycle.
When the number of evaluated strips reaches certain number and waste container is full, the message "Waste Box Full" will appear on the screen. It is possible to measure next 20 strips with this message. The waste container must be emptied before placing the next strips. The continuing measurement will cause the interruption of the process. After adjustment to the right position all strips that were already on the feeder are displaced from the transport belt to the waste container. It is necessary to repeat the measurement of these samples once more with new strips in the next measurement cycle.

6. Memory and database archiving

The Laura M stores results of the last 2000 measurements and offers a choice of archiving of test reports.

Click on "Reports" in Settings menu and the following screen appears. In this screen you can search the results according the testing date (figure 6.1):

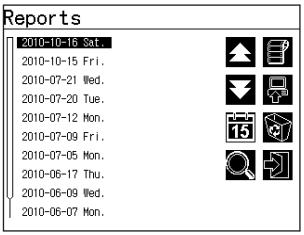


Figure 6.1

The screen displays the results from the last 10 days (days when the measurements were done). Description of functions of various buttons is given in table 6-1:

Button	Function
	Goes to the previous page with results (newer data)
	Goes to the next page with results (older data)
	Selection according to the date of measurement
	Viewing of results according to the date of measurement
	Printing of the selected results according to the date of measurement
	Transmission of selected results to host computer
	Deleting of selected results
	Return to main menu

Table 6-1

6.1 Printing of Selected Results

Click on icon. The user is prompted by urine analyzer LAURA M to enter the requested date of measurement (figure 6.2):

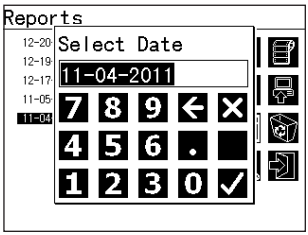


Figure 6.2

Click on ☑ to save the selected date.

Another option is to select from the memory the corresponding sequence numbers. Click on icon. The user is prompted by urine analyzer LAURA M to enter the initial sequence number (figure 6.3):

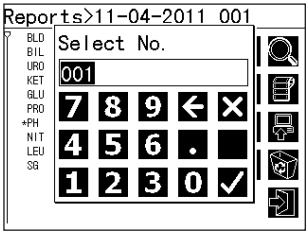


Figure 6.3

After entering the initial sequence number click on ☑ to confirm the selection. Subsequently the user is prompted by urine analyzer LAURA M to enter the ending sequence number. Enter the number and click on ☑ icon.

The results corresponding to the selected date or the sequence numbers interval are printed after clicking on ☑ icon. The data can be printed by built-in or external printer.

6.2 Data Transmission to Host Computer

Selected results can be sent to host computer. The selection is done as at printing by date or sequence numbers. Click on icon. Enter the selected date or sequence number.
Click on ☑ icon to confirm the selection.

After the confirmation by clicking on ☑ icon the selected data are sent to host computer.

6.3 Deleting of Selected Results

Click on icon to delete the selected data.

The deleted results are irretrievably lost. Be very careful during this operation.

6.4 Viewing of Results

Click on icon to search and view the test results (figure 6.4):

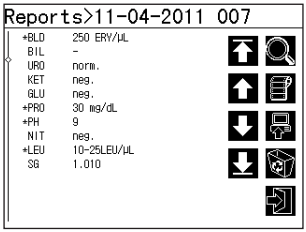


Figure 6.4

The function of buttons in this window is described in following table:

Button	Operation
	Shows the newest result of selected day
	Shows the previous result
	Shows the next result
	Shows the oldest result of the selected day
	Entering of measurement number which corresponds with the result
	Printing of selected result
	Sending of selected result to host computer
	Deleting of selected result
	Return to main menu

Table 6-2

7.1 Daily Maintenance

Since the urine analyzer uses an automatic assessment mechanism it is necessary to observe certain rules and procedures when cleaning. Regular maintenance of urine analyzer LAURA M extends its time of life and ensures accurate and correct results.

Biohazard! Pay attention to the protection during handling.

7.2 Cleaning Procedure of Plastic Feeder

It is recommended to perform the cleaning of plastic feeder every day after shutdown of the unit.

The cleaning procedure of plastic feeder:

Switch OFF the urine analyzer Remove the plastic feeder from the urine analyzer. Rinse the feeder with water and wipe it with wet cloth. After drying insert the plastic feeder back into the analyzer. Make sure that the feeder is placed into the correct position. Figure 7.1 and figure 7.2 show how to handle with the plastic feeder.

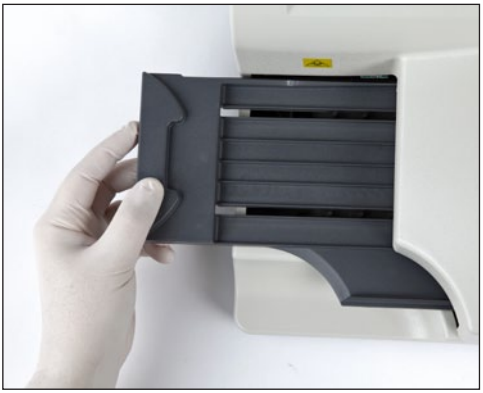


Figure 7.1

Figure 7.2

Biohazard! Observe standard safety precautions and operator safety during the above procedure.

The plastic feeder is one of the most important parts of urine analyzer LAURA M. Do not use detergents, solvents or hot water for cleaning. Damage of feeder can influence the test results!

7.3 Cleaning Procedure of Waste Container

It is recommended to perform the cleaning procedure of waste container every day.

The cleaning procedure of waste container:

Switch OFF the urine analyzer. Remove the waste container with used strips from the analyzer. Empty the container and rinse it with water. Wipe it with the dry cloth. Insert the waste container back in its position and ensure that is correctly.

Figure 7.3

Biohazard! Observe standard safety precautions and operator safety during the above procedure.

The test strips are intended only for single use and cannot be recycled or used repeatedly. The used test strips have to be disposed in accordance with guidelines for waste disposal.

7.4 Fuse Replacement

In the event of blown fuse, disconnect the power cord from the mains supply. Use a flat screwdriver to open the fuse box. Replace the fuse with the fuse of correct rating. Close the cover and refix the screws.

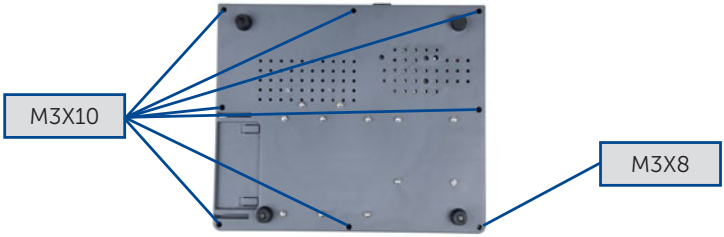
Please use only the fuse that was delivered with the urine analyzer. Specification of fuses: diameter – 5 mm, length – 20 mm, 250V/2A, T2AL250V.

7.5 Clock Battery Replacement

To support the system clock the battery (3V) is placed on the basic plate of urine analyzer LAURA M.

Follow this procedure when replacing the battery:

1) Disconnect the power cord from the mains supply.
2) Turn over the urine analyzer carefully so that its bottom side is accessible.



3) Unscrew 7 screws (type M3 x 10) and another one screw (type M3 x 8).
4) Make sure all screws are safe kept safely.
5) Turn the urine analyzer the right side.

6) Carefully open the upper cover and find the battery holder.
7) Replace the battery.
8) Close the covers by fixing all 8 screws.

8. Service information

Compliance with the instruction of operation and maintenance of urine analyzer LAURA M ensures its proper functioning. In the moment when an error is detected the screen displays the corresponding error message. The message helps to find the right solution of the problem. The table 8-1 lists the available error messages, including code, description and solution.

Error	Error description	Problem and its solution
E01	Operating system error	System memory error. Urine analyzer is not able to operate. Please contact service engineer.
E02	System data error	Stored system controls and calibrations are lost. Urine analyzer is not able to operate. Please contact service engineer.
E03	Threshold error	System error associated with test strip. Please contact service engineer.
E10	Transport belt error	System error associated with transport belt. Please contact service engineer.
E11	Transport belt error	System error associated with mobility of transport belt. Please contact service engineer.
E12	Test strip sensor error	Test strip sensor failure. Please contact service engineer.
E21	Test component motion abnormal	The scanning motor is failure, or the belt clip is loose. Please contact service engineer.
E22	High intensity	Beyond the data range. Please contact service engineer.
E23	Intense light	Cause of this error message may be damage of the analyzer housing and/or proximity of intense light source. Light affects the measurement. If this is not the cause of problem please contact service engineer.
E30	Printer out of paper	The printer is out of paper in a moment when measurement results are ready for printing.
E31	Faulty position of feeder	Check the position of plastic feeder. Try to reinstall it. Follow the instruction in paragraph 7.2.
E32	Contamination of feeder	The urine sample was detected on the feeder. Please clean the plastic feeder as described in paragraph 7.2.
E33	Incorrect position of waste container	Check the position of waste container. Try to reinstall it.
E34	Waste container is full	Remove the waste container. Dispose the used strips. Reinstall the waste container in correct position.
E42	Incorrect position of test strip	The incorrect position of test strip was detected. This test strip cannot be evaluated correctly. The measurement is to be repeated. The other strips will be evaluated correctly. The new measurement of the test strip can be performed after finishing the run.

Table 8-1

8.1 Service Information

If an error appears try to solve it in compliance with the table 8-1. If the problem continues, contact your distributor or service engineer.

WARRANTY SERVICE
Erba Lachema s.r.o. warrants the urine analyzer LAURA M against any manufacturing defects for 12 months from the shipment date (unless otherwise specified by the seller).

CUSTOMER SERVICE
The service during and after the warranty period is rendered by the authorized representative distributor.

8.1.1 Warranty Conditions

The warranty conditions are included in the sales agreement. The close of sales agreement specifies the parts of the urine analyzer that are excluded from the guarantee.

8.1.2 Safety Information

Urine analyzer LAURA M complies with the EMC Directive 89/336/EEC and low voltage devices Directive 73/23/EEC.

Urine analyzer LAURA M in combination with PHAN® LAURA/Uro-dip test strips complies with the requirements of IVD Directive 98/79/EC.

8.1.3 Producer

The producer of urine analyzer LAURA M and test strips PHAN® LAURA/Uro-dip:

Erba Lachema s.r.o.
Karásek 1d
621 33 Brno
Czech Republic

8.1.4 Ordering Information

Catalogue number:

Urine analyzer LAURA M	–	50004173
DekaPHAN® LAURA	–	10008297
MicroalbuPHAN® LAURA	–	10010262
Uro-dip 10 e	–	FREUSPLI0001

9. Communication (RS232)

9.1 Serial cable

The serial cable is a part of LAURA M accessories. The cable supports the communication between host computer and RS232 port. In case of urine analyzer LAURA M port use DB9 connector (male) and for host computer use DB9 (female) – the connection specified the table 9-1:

Analyzer: Port DB9 (male)	PC: Port DB9 (female)
2 ◄	► 2
3 ◄	► 3
5 ◄	► 5

Table 9-1

9.2 Basic Specification

Parameter	Specification
Communication mode	Asynchronous serial communication
Communication signals	TXD, RXD, GND
Available baud rate	9600, 19200, 38400, 57600 bits/sec
Parity	Odd
Data bits	8 bits
Stop bit	1 bit

Table 9-2

9.3 Communication Protocol

Urine analyzer LAURA M sends the data to host computer. Urine analyzer is a sender and it does not receive any data (Uni directional communication only). Host computer is a receiver and does not send any data.

The data are sent as frames. Each frame is a complete package of result and consists of 15 lines. Each line ends with ASCII code 0DH and 0AH. Each line consists of one or two fields. The fields are separated by ASCII code 09H.

The table 9-1 lists all the data of the frame.

Line	Field 1	Field 2	Description
1	Date: 20XX-XX-XX		Only 1 field
2	Time: XX:XX:XX		Only 1 field
3	Sample Number: XXX		Only 1 field
4			Blank
5	Name of item 1	Item 1	
6	Name of item 2	Item 2 result	
7	Name of item 3	Item 3 result	
8	Name of item 4	Item 4 result	
9	Name of item 5	Item 5 result	
10	Name of item 6	Item 6 result	
11	Name of item 7	Item 7 result	
12	Name of item 8	Item 8 result	
13	Name of item 9	Item 9 result	
14	Name of item 10	Item 10 result	
15	Name of item 11	Item 11 result	Blank if using 10-item strip

Table 9-3

In the reports are the characters „±" and „µ" replaced with characters „+ -" and „u".

Host computer does not respond to any data after receiving the frame report.

10. Quick Start Guide

1) Check carefully if the urine analyzer is intact and there are no signs of damage.

2) Connect the urine analyzer to the mains supply with the relevant cable, check the connection.

3) Switch ON the analyzer with the main switch.

4) Wait until the self-test is completed.

5) Set up the mode of results (direct printing after measurement, sending to host computer etc.):

6) Now you can start the measurement in the mode Seq.No.

7) Perform the measurement of patient urine samples. Follow the recommendation included in the instruction of the diagnostic strips during the analysis.

8) Perform the daily maintenance and cleaning of the feeder and waste container after finishing the day's work.

9) Now you can leave the urine analyzer in standby mode or you can switch it off using the main switch.