Insight[®]

Service Manual

U120 Urine Analyzer



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1. General Information

1.1 Instruction

The U120 Urine Analyzer is a reflectance photometer that analyzes the intensity and color of light reflected from the reagent areas of a urinalysis reagent strip. The analyzer also prints testing results through the internal or external printer.

This service manual describes the control and repair of the U120. It is written for use by a well-trained service engineer, who is experienced in repairing and maintaining instruments for Diagnostic investigations.

The U120 is a precise, calibrated optical measurement system. The listed operations below must be accomplished with special attention and precision. Please take special care to disconnect the device from the power supply if this is required by the instruction. If spare parts or accessories are needed, it is absolutely necessary to use only original spare parts for this instrument.

1.2 Components and Subassembly

- Keypad
 Liquid Crystal Display
- 3. Printer Cover
- 4. Paper Release Lever
- 5. Printer Roller
- 6. Printer Paper
- 7. Printer Cover Pull
- 8. Printer Paper Access Slot
- 9. Strip Holder

- 11. Strip Holder Stop
- 12. White Calibration Circle
- 13. Strip Holder Mount
- 14. USB Port
- 15. External Printer Port
- 16. Standard RS232C Port
- 17. Power Socket Fuses
- 18.
 - 19. Power Switch





10. Strip Holder Channel

No.	Subassembly					
Α	Printer Unit					
В	LCD					
С	Printer board PCB					
D	Keyboard					
E	Power Switch Unit					
F	Data Transfer Cable Unit					
G	Switching Power Supply					
н	Strip Carrier and Detection Unit					
I	Main board					



2 Operating instruction











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3 Check and Repair

3.1 Check and replacement of Switching Power Supply and Main Board



3.2 Check and replacement of LCD







3.3 Check and replacement of Strip Carrier and Detection Unit



3.4 Check and replacement of Keyboard



3.5 Check and replacement of Battery



3.6 Check and replacement of Data Transfer Cable Unit



3.7 Check and replacement of Printer Unit









Section	Content	Operation	Figure
3.1	3.1.1	1. Pull the fuse holder	Figure 1.
Power	Replace the	at the back of	SN 197A0000FFD
Switch	Fuse	analyzer out, Figure	
Unit and		1.	
Main			
Board			
			Figure 2.



3.1.2	3.1.2.1 Open the Upper	Figure 1
Open and	Housing	
close the Upper Housing	 Make sure the strip holder mount is in the retracted position as in Figure 1. Remove 4 screws at the back of analyzer using Phillips screwdriver, Figure 2. Open the Upper 	Print Cancel Start
	Housing according	
	to Figure 3.	
		Figure 3.
		Step1

3.1.2.2 Close the Upper Figure 1.

and

Housing Close the Upper 1. Housing Bottom Housing, making sure they

are positioned properly, especially the screw location marked in Figure 1.

2. Install and tighten all 4 screws, Figure 2.



Figure 2.



3.1.3	1	Open the	Unper	Figure 1
Replac	ce the	Housing. Re	efer to	
Switch	ning	Section 3.1.2	.1	Listen si wei offer ald evi veni Si junt si wei offer ald evi Si junt si ju
Power	· 2	. Turn the	Power	
Supply	y	Switch on.	Turn it	
		off when th	ne strip	
		holder mount	t moves	
		to the locat	tion as	
		shown in Fi	gure 1.	
		Make sure th	e screw	
		marked in F	igure 1	
		can be seen.		
	3	. Unplug al	l the	
		connectors	marked	
		in Figure	2 and	
		remove all 4	screws	Figure 2
		Remove the	igure 5.	
		board Figure		
		bourd. I igure		
				The same of the sa

Figure 4. 4. Turn the analyzer to its back and remove the rubber foot marked in Figure 4. 5. Loose the screw beneath the foot using Allen Hex Plus Multi Angle Long Arm Key in Figure 5 and take it out from the front of the analyzer, Figure 6. Figure 5. Figure 6.



8. Take the component base out of the plastic housing. Turn the component base over and remove the 3 screws marked in Figure 9. Remove the Switching Power Supply in Figure 10. 9. Place a new

 Place a new Switching Power Supply onto the base and reinstall all screws.

Caution: take care to ensure all wires are connected to their proper terminal locations, shown in Figure 11.











3.1.4	1. Open the Upper	Figure 1.
Replace the Wire Harness from Switching Power Supply to Main Board	 Open the Opper Housing. Refer to Section 3.1.2.1. Remove the 4 screws and unplug the connector marked in Figure 2. Replace the cable, screwing the 4 wires down to the power supply terminals as shown. Plug in the connector. 	Figure 1.
		Figure 2.
215	1 0 4 11	T14
3.1.5 Replace the Main Board	 Open the Upper Housing. Refer to Section 3.1.2.1. Remove the main board, see chapter 3 in Section 3.1.3. Replace the main board, tighten all screws, and plug in all connectors as in Figure 1. 	

3.1.6		1.	Open	the	Upper	Figure 1.
Repla	ace the		Housin	g. R	efer to	0
Powe	er		Section	3.1.2	.1.	
Swite	ch	2.	Loose	the	wire	
Unit			harness	by re	emoving	
		3.	3 screw Figure snap a Power using screwd push it Push of two sna of Po	vs ma 1. Pr t the Swite river out. ut bot aps at ower	hild the and h of the Switch	Figure 2.
			Unit, F	igure	2.	



3.2	3.2.1	1. Open the Upper Figure 1.
LCD	Replace the	Housing. Refer to
	LCD to	Section 3.1.2.1.
	Printer	2. Unplug the two
	Board	connectors marked
	cable	in Figure 2.
		Connect a new
		cable without
		installing and check
		whether the failure
		is eliminated,
		Figure 2.
		3. If the failure is Hd-N -=
		eliminated, remove Figure 2.
		the damaged cable
		and install the cable
		as in Figure 3.
		Caution: the LCD
		connector is very tight.
		When unplugging this
		cable do not pull on the
		wires.
		A AVAN 2661 1 80
		L- LANA -
		Elemente 2
		rigure 5.
		5661 106C VW-1 N-FB

		4	0 1 U	
3.	.2.2	1.	Open the Upper	Figure 1.
R	leplace the		Housing. Refer to	
50	0-Pin Flat		Section 3.1.2.1.	
C	Cable	2.	Unplug the two	
			connectors of the	
			cable marked in	
			Figure 2. Connect a	
			new cable without	Bd-N I-MA 2001 1987
			installing and aback	
				I G93 WWV TN 4-YHF
			whether the failure	
			is eliminated.	
			Figure 2.	
		3.	If the failure is	
			eliminated, take off	Figure 2.
			the damaged cable	
			marked in Figure 2.	Damaged Calific
			Install the cable like	
			Figure 3.	
			0	
				Figure 3.
				8d-N 1-MA 2901 1982
				A DECEMBER OF A
				LEAST MANN IN VIVIL

3.2.3	1	. Open the Upper	Figure 1.
Replace	the	Housing. Refer to	
LCD		Section 3.1.2.1.	
	2	. Unplug the LCD	
		connector.	
	3	. Remove the 4	
		screws marked in	
		Figure 1.	
	4	. Replace the LCD	
		and tighten all 4	
		screws.	
3.2.4	1	. Open the Upper	Figure 1.
Replace	the	Housing. Refer to	
Printer		Section 3.1.2.1.	
Board	2	. Unplug the 4	
		Printer board	
		connectors.	
	3	. Remove the 4	
		screws marked in	
		Figure 1.	
	4	. Replace the Printer	
		board and tighten	if the
		all 4 screws.	
			5691 1 20
3.2.5	1	. Open the Upper	Figure 1.
Potentio	ome	Housing. Refer to	
ter		Section 3.1.2.1.	
adjustm	ent 2	. Adjust the	
		potentiometer on the	
		Printer board using	
		ceramic screwdriver	
		slotted tip as shown	
		in Figure 1.	
	3	. Observe the	
		brightness of the	
		LCD, adjusting until	1 2 2 2 3 1 / / / × 1 3
		the proper	0 4 4 4 M
		brightness is	
		observed.	

3.3 Detect	3.3.1	1. Open the Upper Figure 1.
Unit	Replace the	Housing. Refer to
	Strip	Section 3.1.2.1.
	Carrier	2. Unplug the
	and	connectors marked
	Detection	in Figure 1.
	Unit	3. Remove all 4
		screws marked in
		Figure 1.
		4. Replace the Strip
		Carrier and The Contract of th
		Detection Unit and
		reinstall all 4
		SCIEWS.

		1			
	3.3.2	1.	Open the	Upper	Figure
	Replace the		Housing. R	Refer to	1.
	FFC from		Section 3.1.	2.1.	
	Strip	2.	Replace th	e FFC	
	Carrier		cable and	plug it	
	and		into the cor	nnectors,	
	Detection		Figure 1.		
	Unit to				
	Main				
	Board				
					A THOUSAND AND A DECISION AND A DECI
1	1	1			

3.4	3.4.1	1. Open the Upper	Figure 1.
Keyboard	Replace the Keyboard to Printer Board cable	 Housing. Refer to Section 3.1.2.1. 2. Unplug the two cable connectors marked in Figure 1. 3. Replace the cable and insert the connectors. 	
	3.4.2 Replace the Keyboard	 Open the Upper Housing. Refer to Section 3.1.2.1. Unplug the connector marked in Figure 1. Remove all 9 screws marked in Figure 1. Replace the Keyboard and tighten all 9 screws. Caution: install the keyboard positioned as shown in Figure 1. 	Figure 1.

3.5	3.5.1	1. Open the Upper Figure 1.
Battery	Replace the	Housing. Refer to
	Battery	Section 3.1.2.1.
		2. Press the button
		marked in Figure 1
		to release the
		battery from the
		holder.
		3. The battery should
		pop out of the
		holder.
		4. Replace the battery
		and press it tightly
		into the holder until Figure 2.
		it is retained by the
		clip shown.
		(Caution: if the battery
		does not pop out,
		carefully pry the
		battery out after when it using a
		releasing it using a small scrowdriver
		sman screwuriver.

3.6	3.6.1	1.	Open the Upper	Figure 1.
Data	Replace the		Housing. Refer to	
Transfer	USB to		Section 3.1.2.1.	
Cable Unit	Main	2.	Unplug the two	
	Board		connectors of the	
	cable		cable marked in	
			Figure 1.	
		3.	Replace the cable	
			and plug the	
			connectors in.	
				Figure 2.
				Figure 3.



	2 г		the 1	Etaura 2
	3. F s u F 2 S 4. F 1 a s	Remove crews lised fo Port) mar c using Cockets, F Replace Fransfer (nd tight crews, Fi	the 4 (specially r RS232 ked in Fig two Hex Figure 3. the Data Cable Unit en all the gure 4.	<image/>
				<image/>

3.7	3.7.1	1. Open the Upp	er Figure 1.
Printer	Replace the	Housing. Refer	to
Unit	Printer	Section 3.1.2.1.	
Umt	Unit	 Section 3.1.2.1. Unplug the connector marked in Figure 2. Remove all screws marked Figure 2. Replace the Print Unit and tighten a 4 screws. 	he ed 4 in her all
			Figure 2.

3.7.2	1.	Raise the green	Figure 1.
Clean the		lever as shown in	
Printer		Figure 2 and	
Roller and		remove the printer	
Printer		paper.	
Head	2.	Clean the printer	
		roller and printer	
		head using cotton	
		swah dipping in	
		75% alcohol	
		solution	
	2	After the closed	
	5.	Arter the cleaned	
		area is dry, position	
		the green lever	rigure 2.
		down again, Figure	
		1.	
			Figure 3.

4. Spare parts

Part No.	Name	Subassembly	Figure
001	LCD	LCD	
002	Printer Unit	Printer with Printer Box	
003	Printer board	Printer board	

004	Main Board	Main Board	
005	Switching Power Supply	Switching Power Supply	
006	Strip Carrier and Detection Unit	Strip Carrier and Detection Unit	
007	Keyboard	Keyboard	

008	Battery	Battery	Revise Panason Revise
009	Data Transfer Cable Unit	Data Transfer Cable Unit	V VEIDUIDI
010	Power Switch Unit	Power Switch Unit	
011	USB to Main Board Cable	USB to Main Board Cable	
012	Keyboard to Printer board Cable	Keyboard to Printer board Cable	
013	LCD to Printer board Cable	LCD to Printer board Cable	

014	Switching Power Supply to Main Board Wire Harness	Switching Power Supply to Main Board Wire Harness	
015	Strip Carrier/Detection Unit to main board FFC	Strip Carrier/Detection Unit to main board FFC	те – Кал Бел К жандовер вляте – Кал Бел К жандов колло – Ча Бел К Жандов колло – Кал Бел К канд
016	50-Pin Flat Cable	50-Pin Flat Cable	

Error message	Reason	Trouble shooting
	Fuse is blown	Replace fuse. Section 3.1.1.
Analyzer - no response	The input voltage of Switching Power Supply is	Measure the input voltage of Switching
	abnormal.	Power Supply.
	Main board is damaged.	Replace main board Section 3.3.3.
Analyzer speaker on continuously	Main board is damaged.	Replace main board Section 3.3.3.
	The cable connecting LCD to Printer board is loose or damaged.	 Reseat the cable connectors. Replace with a new cable Section 3.4.2.
LCD - no display	The 50-pin flat cable connecting main board to Printer board is loose or damaged.	 Reseat the cable connectors. Replace with a new 50-pin flat cable. Section 3.4.1.
	LCD is damaged.	Replace with a new LCD. Section 3.4.3.
	Printer board is damaged.	Replace with a new Printer board. Section 3.5.2.
	Main board is damaged.	Replace main board. Section 3.3.3.
	Potentiometer adjusting on Printer board is not properly.	Adjust potentiometer on Printer board. Section 3.9.2.
LCD display is	The cable connecting LCD to Printer board is loose or damaged.	 Reseat the cable connectors. Replace the cable Section 3.4.2.
abnormal.	The 50-pin flat cable connecting main board to Printer board is loose or damaged.	 Reseat the cable connectors. Replace the 50-pin flat cable. Section 3.4.1.
	LCD is damaged.	Replace the LCD. Section 3.4.3.
	Printer board is damaged.	Replace the Printer board. Section 3.5.2.
	Main board is damaged.	Replace main board. Section 3.3.3.
The strip holder mount can't move	The strip holder mount is fallen off.	Replace the Strip Carrier and Detection Unit. Section 3.2.2.
	The strip holder mount is on the extreme limit of the Strip Carrier location and could not return to initial position during strip testing.	 Replace the Strip Carrier and Detection Unit. Section 3.2.2. Replace main board. Section 3.3.3.
	Stepper motor has bad contact with main board.	 Reseat the cable connectors. Replace the Strip Carrier and Detection Unit. Section 3.2.2.
	Strip Carrier and Detection Unit has bad contact with main board.	 Reseat the cable FFC cable ends. Replace the FFC. Section 3.2.1.
	Stepper motor is damaged.	Replace the Strip Carrier and Detection Unit. Section 3.2.2.

5 Error messages, possible reasons and troubleshooting

	The Optical AMP board is damaged.	Replace the Strip Carrier and Detection Unit. Section 3.2.2.
	Main board is damaged.	Replace main board. Section 3.3.3.
Main control unit failed	Main board is damaged.	Replace main board. Section 3.3.3.
Optical sensor failed	 White calibration circle is not clean. Strip Holder is positioned incorrectly on Strip Holder mount. The Strip Carrier and Detection Unit is damaged. 	 Clean the white calibration circle. Adjust Strip Holder to correct position. Replace the Strip Carrier and Detection Unit. Section 3.2.2.
Strip Carrier and	The Strip Carrier and Detection Unit or Main	Replace the Strip Carrier and Detection
Exceed light failed	 The Strip Holder Mount is not clean. The Strip Carrier and Detection Unit or Main board is damaged. 	 Unit or Main board. Section 3.3.3. Clean the Strip Holder Mount. Replace the Strip Carrier and Detection Unit or Main board. Section 3.3.3.
	The cable connecting keyboard to Printer board is loose or damaged.	 Reseat the cable connectors. Replace the cable. Section 3.6.1.
Keyboard abnormal	The 50-pin flat cable connecting main board to Printer board is loose or damaged.	 Reseat the cable connectors. Replace the 50-pin flat cable. Section 3.4.1.
	Keyboard is damaged.	Replace a new keyboard. Section 3.6.2.
	Printer board is damaged.	Replace with a new Printer board. Section 3.5.2.
	Main board is damaged.	Replace main board. Section 3.3.3.
Menu display failure	Main board is damaged.	Replace main board. Section 3.3.3.
	Battery is out of power.	Replace the battery. Section 3.7.1.
Wrong configuration of Date/Time	Bad contact between battery and battery seat	 Reinstall the battery. Replace main board. Section 3.3.3.
	Main board is damaged.	Replace main board. Section 3.3.3.
Data transport incorrect	Wrong Data Transfer cable	Use correct cable (user manual).
or fails	Wrong computer transmission parameters	Reset correct parameter (user manual).
	Main board to USB board cable is loose or damaged.	 Reseat the cable connectors. Replace with a new cable. Section 3.8.1.
	USB board is damaged.	Replace the Data Transfer Cable Unit. Section 3.8.2.

	Main board is damaged.	Replace main board. Section 3.3.3.
	The printer configuration is not set as "Internal".	Set printer to "Internal" in menu.
	The printer to Printer board cable is loose or damaged.	 Reseat the cable connectors. Replace the cable, Section 3.9.1.
Internal printer does	Main board to Printer board cable (50-pin) is loose or damaged.	 Reseat the cable connectors. Replace with a new 50-pin flat cable Section 3.4.1.
not work	Printer head is not clean.	Clean the printer head.
	Printer head is damaged.	Replace printer head.
	Printer board is damaged.	Replace the Printer board. Section 3.5.2.
	Main board is damaged.	Replace main board. Section 3.3.3.
	The printer is not set as "External".	Set printer to "External" in menu.
External printer	The external printer is not the proper type.	Use proper printer.
abnormal	Main board to printer cable is loose or damaged.	 Reseat the cable connectors. Replace the cable.
	Main board is damaged.	Replace main board. Section 3.3.3.
	Main board to USB board cable is loose or damaged.	 Reseat the cable connectors. Replace with a new cable. Section 3.8.1.
Barcode Reader abnormal	USB board is damaged.	Replace the Data Transfer Cable Unit. Section 3.8.2.
	Barcode Reader is damaged.	Replace the Barcode Reader.
	Main board is damaged.	Replace main board. Section 3.3.3.
	The Strip Holder Mount is not in proper location.	Install the strip holder mount as in user manual.
	The Strip Holder Mount is not clean.	Clean the strip holder mount as in user manual.
Testing data incorrect	The white calibration circle is not clean.	Clean the white calibration circle as in user manual.
Tosting data moorroot	High and low frequency is abnormal.	Replace the Strip Carrier and Detection Unit. Section 3.2.2.
	The Optical AMP board is damaged.	Replace the Strip Carrier and Detection Unit. Section 3.2.2.
	Main board is damaged.	Replace main board. Section 3.3.3.

6. Cleaning and Maintenance

6.1 Daily Cleaning

Clean the strip holder channel with water after each use.

6.2 Periodic Cleaning (Urine deposit cleaning)

Clean the strip holder channel with 0.1 N NaOH.

(Warning: Do not allow the NaOH solution to touch the White Calibration Circle.)

Cleaning procedure				
Procedure	Figure	Procedure	Figure	
1. Turn off the analyzer when the strip holder is fully extended.		4. Dry the strip holder with a clean, dry cotton ball or paper.		
2. Pull the Strip Holder backwards gently using the front two sides of Strip Holder as illustrated.		5. Insert the Strip Holder into the Strip Holder mount. When correctly positioned, the Strip Holder will snap in and be locked in place. The White Calibration Circle		
 3. Clean the Strip Holder channel using a cotton swab or cotton ball with distilled water. (Do not touch the white calibration circle.) 	White circle			

7. Language Chip Replacement Package Insert

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Language Chip Replacement Package Insert			
Procedure	Figure		
Open the upper Housing, refer to Section 3.1.2.1.			
Locate the PLCC44 Chip on the main board.	PLCC44 Chip		
Remove the original PLCC44 Chip from the holding socket with the PLCC extractor.			
 Insert the new PLCC44 Chip in the same direction as the original PLCC44 Chip. Press the PLCC44 Chip into the holding socket with fingers. 			
Locate the PLCC32 Chip on the main board.	PLCC32 Chip		
Remove the original PLCC32 Chip from the holding socket with the PLCC extractor.			
 Insert the new PLCC32 Chip in the same direction as the original PLCC32 Chip. Press the PLCC32 Chip into the holding socket with fingers. 			

Close the Upper Housing, refer to Section 3.1.2.2.	
Plug the power cord into the analyzer and turn the Power Switch on.	07-15-08 준 15:19 실 Mission U120 Urine Analyzer 2008 ACON Laboratories, Inc. All rights reserved Press MENU or START
Press MENU on the keypad to display the MENU screen.	MENU Test Settings Analyzer Configuration Database Solf Test → Exit Press ENTER to change
Move the cursor to <i>Analyzer</i> <i>Configuration</i> and press ENTER . Choose proper language.	Analyzer Configuration Ver X.XX Printer Setup Sound : On Barcode reader : No Language : English Date/Time Auto Number Reset Yes → Exit Press ENTER to change

8. Detection Optimization

Detection Optimization will ensure that the analyzer-read results will be consistent with the visual-read results for one or more of the following analyzes: Leucokyte, Nitrite, Urobilinogen, Protein, Blood, Ketone, Bilirubin, Glucose and Ascorbic Acid. Specific Gravity and pH detection is determined by qualitative values. Contact technical support for more details on optimizing the detection of the U120 Urine Analyzer.