combi ®
scan 100

Service Manual

analyticon

Analyzer for
Combi Screen® 11 SYS
urine test strips

Contents

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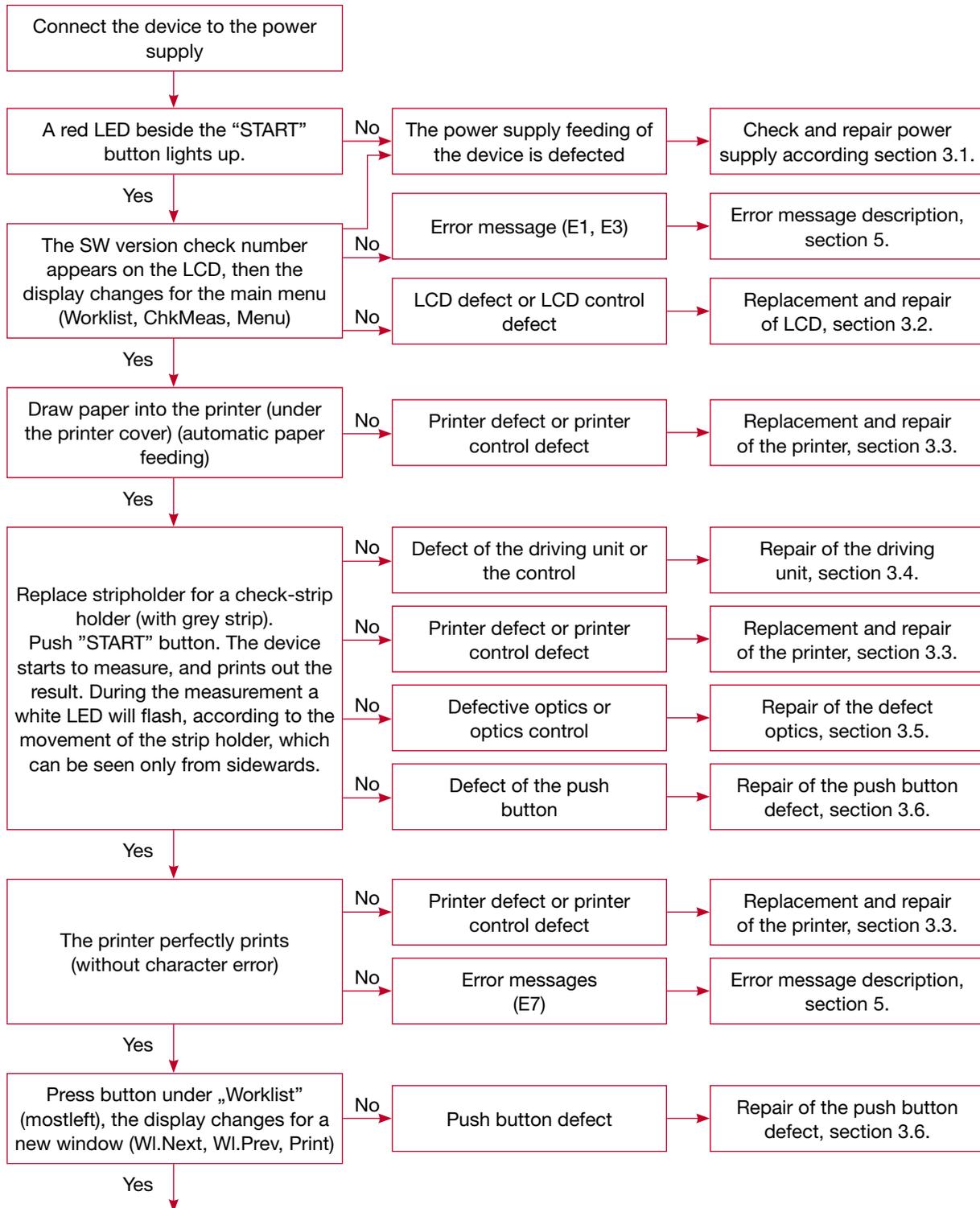   www.analyticon.de

1. General information

This service manual describes the control and repair of the Combi Scan 100. It is written for use by a well trained service engineer, who is experienced in repairing and maintaining instruments for diagnostic investigations. The operations, which are described in this manual, should never be carried out by the enduser of the instrument.

The Combi Scan 100 is a precise and costly 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.

Nevertheless, even a well trained service engineer will not be able to do all operations to get a defective Combi Scan 100 working again, because for several operations special equipment is needed. Depending on the problem, it might be necessary to send the instrument back to Analyticon for repair. More detailed information can be found in this manual. If a return of the instrument to Analyticon is recommended by the manual, please contact Analyticon first to agree on the further steps. Never send the meter back to Analyticon without any written confirmation of Analyticon to do so.

If repair operations are carried out, they are done in the responsibility of the company who does the repair. If the meter is opened for repair, Analyticon will not take any further warranty for this instrument.

2. Check of operation

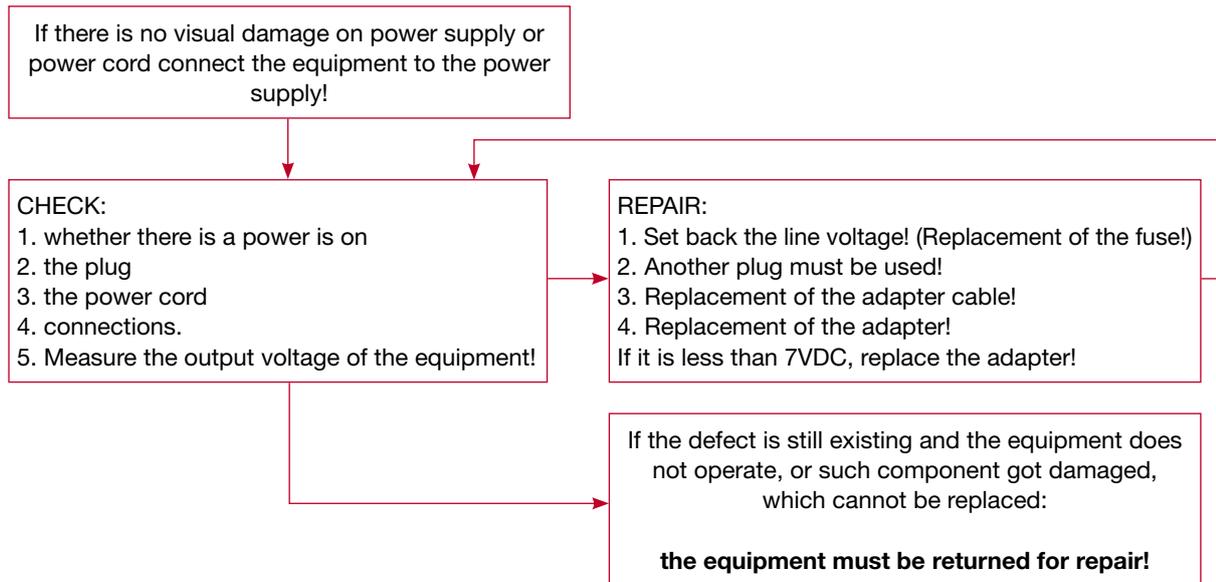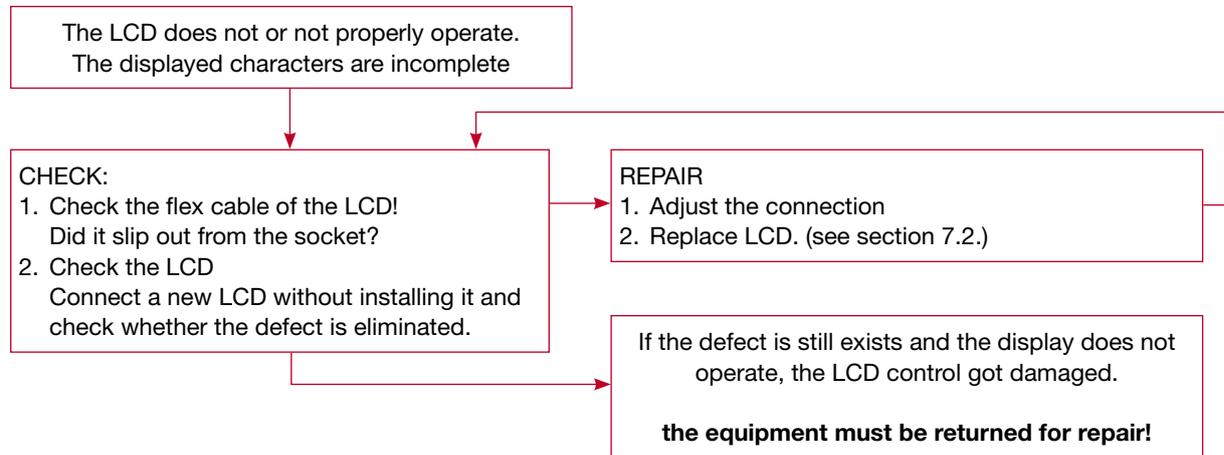|		
Connect the device to the power supply		
↓		
A red LED beside the "START" button lights up.	**No** → The power supply feeding of the device is defected	→ Check and repair power supply according section 3.1.
Yes ↓	**No** → Error message (E1, E3)	→ Error message description, section 5.
The SW version check number appears on the LCD, then the display changes for the main menu (Worklist, ChkMeas, Menu)	**No** → LCD defect or LCD control defect	→ Replacement and repair of LCD, section 3.2.
Yes ↓		
Draw paper into the printer (under the printer cover) (automatic paper feeding)	**No** → Printer defect or printer control defect	→ Replacement and repair of the printer, section 3.3.
Yes ↓		
Replace stripholder for a check-strip holder (with grey strip). Push "START" button. The device starts to measure, and prints out the result. During the measurement a white LED will flash, according to the movement of the strip holder, which can be seen only from sidewards.	**No** → Defect of the driving unit or the control	→ Repair of the driving unit, section 3.4.
	No → Printer defect or printer control defect	→ Replacement and repair of the printer, section 3.3.
	No → Defective optics or optics control	→ Repair of the defect optics, section 3.5.
	No → Defect of the push button	→ Repair of the push button defect, section 3.6.
Yes ↓		
The printer perfectly prints (without character error)	**No** → Printer defect or printer control defect	→ Replacement and repair of the printer, section 3.3.
	No → Error messages (E7)	→ Error message description, section 5.
Yes ↓		
Press button under „Worklist" (mostleft), the display changes for a new window (Wl.Next, Wl.Prev, Print)	**No** → Push button defect	→ Repair of the push button defect, section 3.6.
Yes ↓		

Press button (mostright) under „Print". The stored worklist is printed. The display will change back to the main menu automatically.	**No** → Push button defect	→ Repair of the push button defect, section 3.6.
	No → SW error	→ SW error handling, section 3.7.
	No → Error messages (E7)	→ Error message description, section 5.

↓ **Yes**

Press button under the „ChkMeas" (middle). "Check mode measurement" is diplayd and check measurement is performed. The device prints out the result of the check measurement. „Valid check" or „Invalid check". Then returns to the main menu automatically.	**No** → Push button defect	→ Repair of the push button defect, section 3.6.
	No → SW error	→ SW error SW error handling, section 3.7.

↓ **Yes**

Press the "START" button. The display goes back to the main menu.	**No** → SW error	→ SW error handling, section 3.7.

↓ **Yes**

Press button under „Menu" (rightmost). Further MENU items are displayed (Setup, MeasMode, Memory).	**No** → Error messages	→ Error message description, section 5.

↓ **Yes**

Main units of the device are operating proper. Different parameters should be checked or set (i.e. date, time, language) according to the user's manual.	**No** → SW error	→ SW error handling, section 3.7.
	No → Problem unsolvable by the service	→ **The equipment must be returned for repair.**

↓ **Yes**

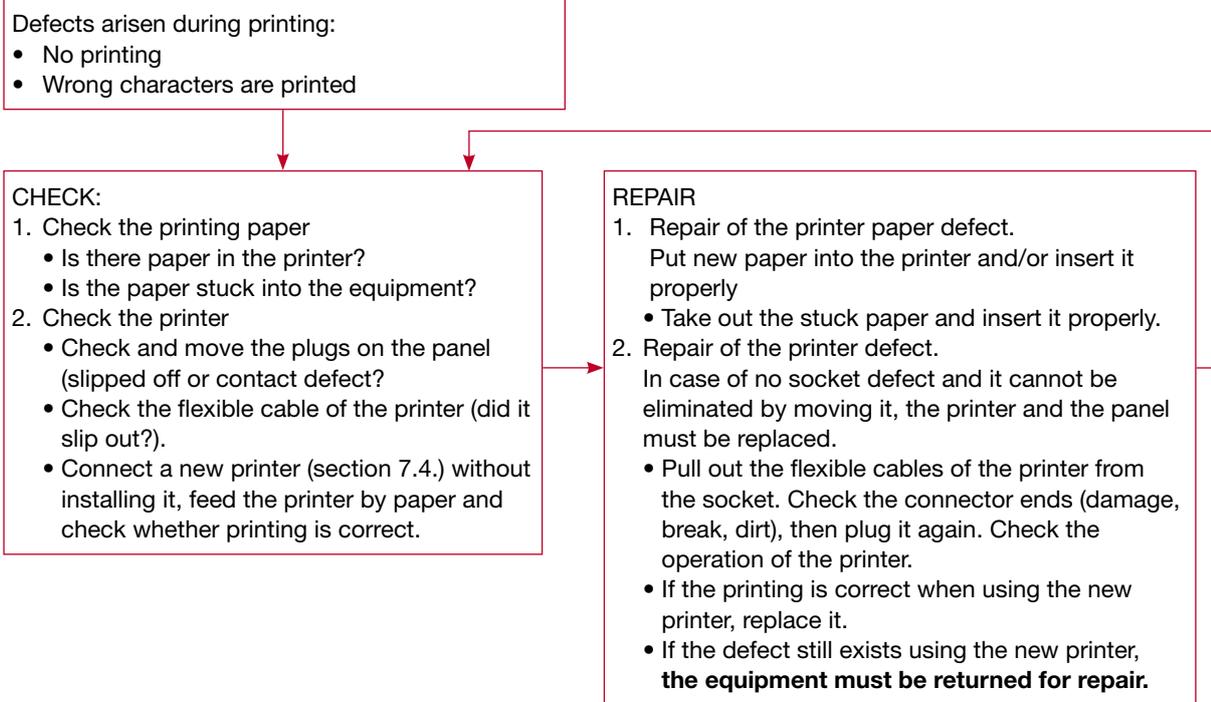|		
Visual test: visible damages of the upper housing, printer cover, plastic push buttons, plexi plate.	**No** → Replacement of the assembled upper housing. See section 5.	

3. Check and repair

3.1 Check and repair of the power supply

Warning! Never open power supply! If the power supply damaged replace it! Also replace power cord if any damage is observable!
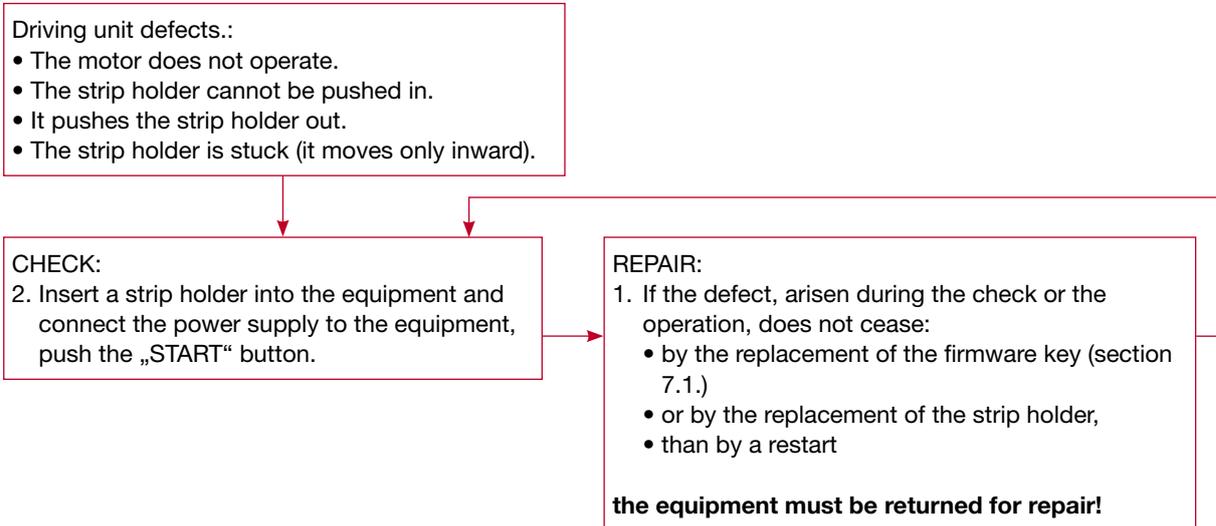
If there is no visual damage on power supply or power cord connect the equipment to the power supply!

CHECK:	REPAIR:
1. whether there is a power is on	1. Set back the line voltage! (Replacement of the fuse!)
2. the plug	2. Another plug must be used!
3. the power cord	3. Replacement of the adapter cable!
4. connections.	4. Replacement of the adapter!
5. Measure the output voltage of the equipment!	If it is less than 7VDC, replace the adapter!

If the defect is still existing and the equipment does not operate, or such component got damaged, which cannot be replaced: **the equipment must be returned for repair!**

3.2. Replacement and repair of the LCD

The LCD does not or not properly operate.
The displayed characters are incomplete

CHECK:
1. Check the flex cable of the LCD!
   Did it slip out from the socket?
2. Check the LCD
   Connect a new LCD without installing it and
   check whether the defect is eliminated.

REPAIR
1. Adjust the connection
2. Replace LCD. (see section 7.2.)

If the defect is still exists and the display does not
operate, the LCD control got damaged.

the equipment must be returned for repair!

3.3. Replacement and repair of the printer

Defects arisen during printing:
- No printing
- Wrong characters are printed

CHECK:
1. Check the printing paper
   • Is there paper in the printer?
   • Is the paper stuck into the equipment?
2. Check the printer
   • Check and move the plugs on the panel (slipped off or contact defect?
   • Check the flexible cable of the printer (did it slip out?).
   • Connect a new printer (section 7.4.) without installing it, feed the printer by paper and check whether printing is correct.

REPAIR
1. Repair of the printer paper defect.
   Put new paper into the printer and/or insert it properly
   • Take out the stuck paper and insert it properly.
2. Repair of the printer defect.
   In case of no socket defect and it cannot be eliminated by moving it, the printer and the panel must be replaced.
   • Pull out the flexible cables of the printer from the socket. Check the connector ends (damage, break, dirt), then plug it again. Check the operation of the printer.
   • If the printing is correct when using the new printer, replace it.
   • If the defect still exists using the new printer, **the equipment must be returned for repair.**

3.4. Handling of the defect driving unit

Driving unit defects.:
• The motor does not operate.
• The strip holder cannot be pushed in.
• It pushes the strip holder out.
• The strip holder is stuck (it moves only inward).

CHECK:
2. Insert a strip holder into the equipment and connect the power supply to the equipment, push the „START" button.

REPAIR:
1. If the defect, arisen during the check or the operation, does not cease:
   • by the replacement of the firmware key (section 7.1.)
   • or by the replacement of the strip holder,
   • than by a restart

the equipment must be returned for repair!

3.5. Handling of the optics defect

Optics unit defects.
• The LEDs do not light.
• The CCD does not detect.
• Optocoupler does not operate.

CHECK:
3. Insert a strip holder into the equipment and connect the power supply, push „START" button. Watching it from sidewards there must be a white light flashing up according to the rhythm of the movement of the strip holder!

REPAIR:
2. If the defects arisen during the check or the operation of the equipment do not cease
    • by the replacement of firmware key (section 11.)
    • then by a restart,

    the equipment must be returned for repair!

3.6. Repair of the push button panel and cable defect

Push button panel and cable defects.
• LED does not light.
• Switches on the PCB do not operate
• Cable is torn, the soldering came off.

CHECK:
4. Insert a strip holder into the equipment and connect the power supply, push „START" button. Measurement has to be started.

REPAIR:
5. Replace start- and push button PCB with cable (UCP-4454-1) with the spare one.
6. If the defect still exists,

the equipment must be returned for repair.

3.7. Handling of SW defect

If defects, arisen during check or operation, do not cease by the replacement of the firmware key and restart.

The equipment must be returned for repair!

4. Spare parts

Order Article No.	Denomination	Content	Figure
UCP-4451-1	Assembled LCD, with frame and plastic shim. The plastic shim is only at later models.	Display, LCD bear frame Assembly: section 7.2	
UCP-4452-1	Assembled printer, with panel	Printer, panel, cable Assembly: section 7.4	
UCP-4453-1	Assembled upper housing	Upper housing, LCD front panel, printer cover, push buttons Assembly: section 7.1	
UCP-4454-1	Spare assembled start- and push button PCB with cable	Start-and push button panel, cables, plugs Assembly: section 7.3	
1ASA7V1A	Power supply type SA125A-0735U-S		
612EPL19	Printer paper	Feeding: section 7.5	
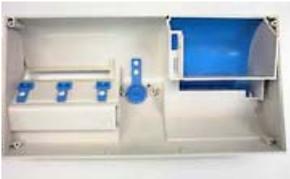
Order Article No.	Denomination	Content	Figure
352USBAB	USB cable_type_a-b/1.8 m		
35200303	Power cord		
UCP-4404-1	Assembled strip holder for CombiScan100		
UCP-4405-1	Firmware		
UCP-4414-1	Assembled check-strip holder	Assembled strip holder with stuck test strip	
UCP-9201-1	User's manual		
UCP-9202-1	CD		

5. Preparation, required instruments, auxiliary material, labour safety regulations

Cross-grooved screwdriver PH1
Cross-grooved screwdriver PZ1
Straight grooved screwdriver size 4

There are no other labour safety regulations different from the general ones concerning the checking, assembly processes listed in this present Service Manual.

No dangerous material is used.

6. Error messages, possible reasons and trouble shooting methods

Error code	Denomination of the error	Reasons for the error	Trouble shooting
E1	Error in the driving of the strip holder ("0" position detection error).	The optical sensor does not detect the existence of the stripholder. Maybe no stripholder is inserted.	Replacement of the strip holder, **if the error is still existing the device should be returned for service.**
E3	Firmware (key-chip) error.	There is no firmware inserted or firmware damaged.	Insert firmware of the right version into the equipment to its determined place. **If the error is still existing the device should be returned for service.**
E4	Communication error (defect of the serial port or cable).	The serial port/plug or cable are defective or the connected unit (PC) doesn't work.	All connections should be fitted. Try to connect to an other device (PC). **If the error is still existing the device should be returned for service.**
E5	"Worklist" download error	Block, longer than 13 characters, or patient ID block not loaded up to 13 characters	Load the patient ID block up to 13 characters. Check communication with the connecting device. **If the error is still existing the device should be returned for service.**
E6	"Worklist full". The memory is fully loaded.	Work list memory is fully loaded.	Data down load from the memory, clear memory.
E7	Printer paper run out or is missing.		Feed the equipment with paper. section 7.5.
W1	No data in the memory to be transferred.		Fill up the memory by some measurements and try again. **If the error is still existing the device should be returned for service.**

7. Assembling instructions

7.1 Replacement of the assembled upper housing (UCP-4453-1)

	Operation	*Figure*
7.1.1.	Disconnect power supply. Remove firmware (under the printer cover). Unscrew the screw (1 pc PT KA 22x8).	
7.1.2.	Turn the equipment upside-down.	
7.1.3.	Unscrew the screws (4 or 5 pcs PT KA 30x8).	
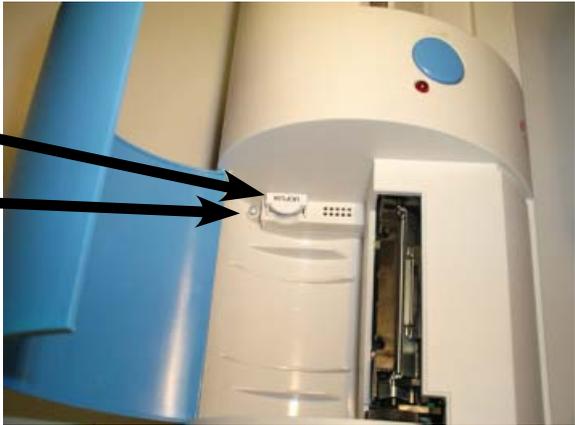
	Operation	*Figure*
7.1.4.	Turn back the equipment.	
7.1.5.	Lift the upper case (upright), tilt it backward in 180 degree. Note the position of the cable.	
7.1.6.	Unscrew the two screws (PT KA 25x6) which fix the start button PCB, pull out the LED assembled onto the PCB from the housing.	
7.1.7.	Put aside the upper case, prepare the new one.	
7.1.8.	Fit LED into the housing (pay attention to the PCB position), screw the two screw in (2 pcs PT KA 25x6).	
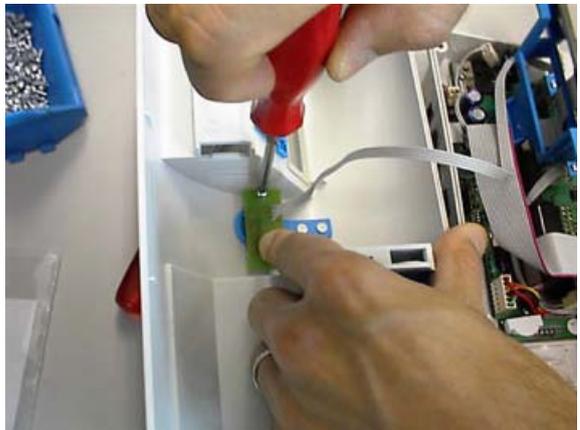
	Operation	*Figure*
7.1.9.	Turn the upper housing onto the bottom case and holding it at right angles arrange the cables (they must not jam between the two parts).	
7.1.10.	Turn the equipment upside down.	Figure according to 7.1.2.
7.1.11.	Screw the screws in (4 or 5 pcs PT KA 30x8, 1 pc PT KA 22x8).	Figure according to point 7.1.3.
7.1.12.	Turn the equipment back.	
7.1.13.	Insert the firmware into its place.	Figure according to point 7.1.1.
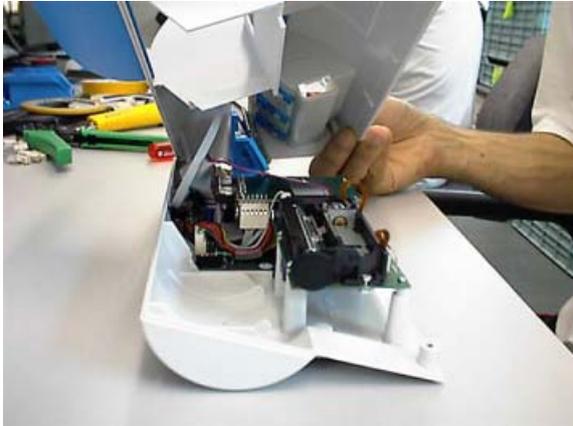
7.2.   Replacement of the LCD (UCP-4451-1)

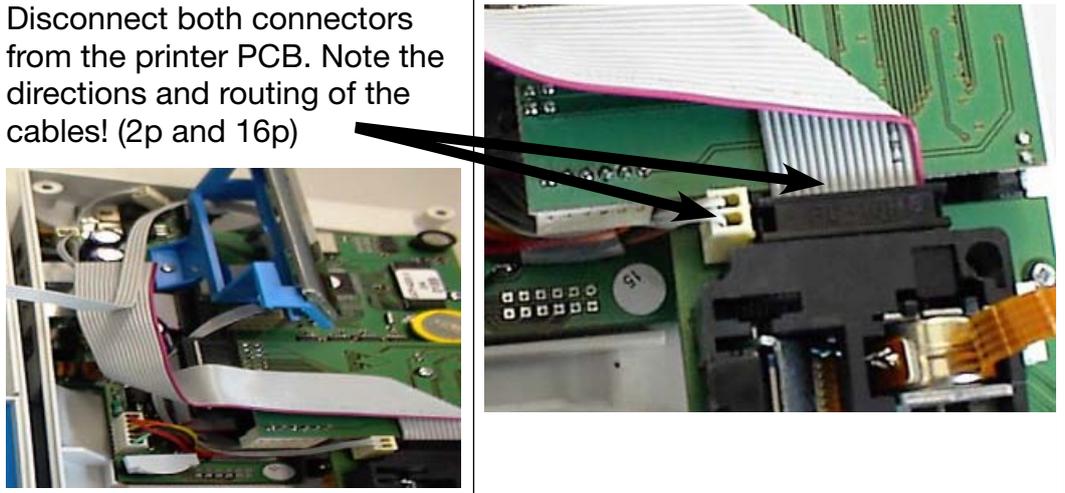|	*Operation*	*Figure*
7.2.1.	Disassemble the equipment.	According to points 7.1.1 – 7.1.5.
7.2.2.	Relase connector fixture on both end by pressing in direction as the red arrow shows. Pull out the flexibile cable from the connector.	
7.2.3.	Unscrew the 2 screws which fix the button PCB to the frame. Remove plastic shim.	
7.2.4.	Unscrew the screws of the LCD frame (3 pcs PT KA 25x8.)	
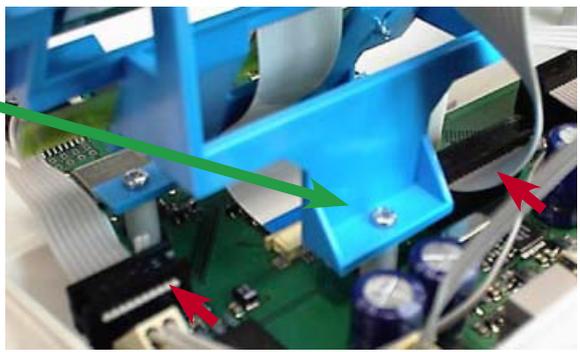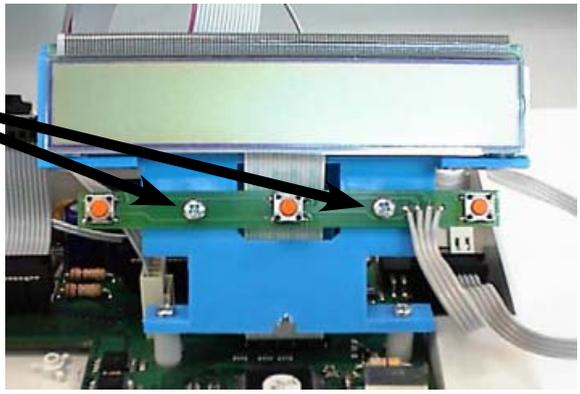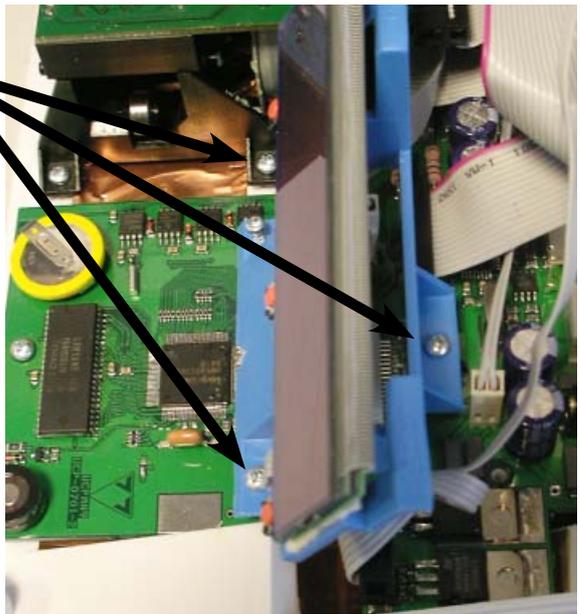
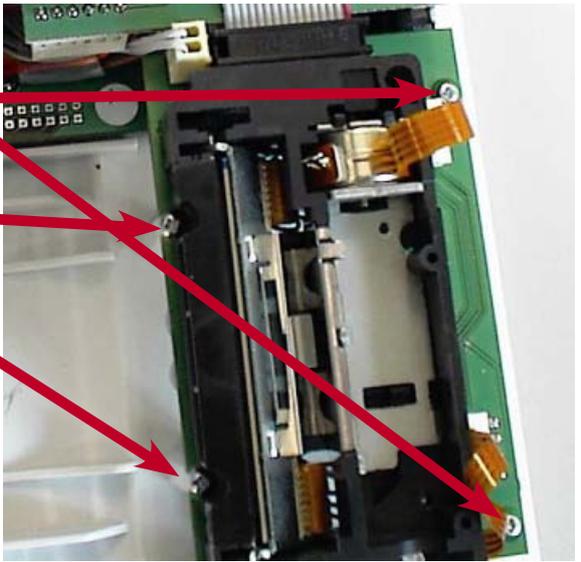|	Operation	Figure
7.2.5.	Replace the frame, assembled with LCD, fit it to its position.	
7.2.6.	Screw in the 3 pcs screws which fix the LCD bear frame (PTKA 25x8).	Figure according to point 7.2.4.
7.2.7.	Screw in the 2 pcs screws which fix the push button panel to the LCD bear frame (PTKA 25x8)	Figure according to point 7.2.3.
7.2.8.	Connect flexibile cable. First insert cable into the slot of the connector. Then fix the connection by pressing both end of connector in diraction shown by the red arrow.	
7.2.9.	Assemble the equipment.	According to 7.1.9 – 7.1.13
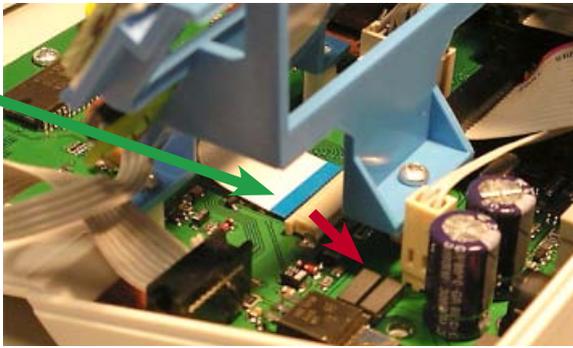
7.3 Replacement of the push button PCB and the connecting cable (UCP-4454-1)

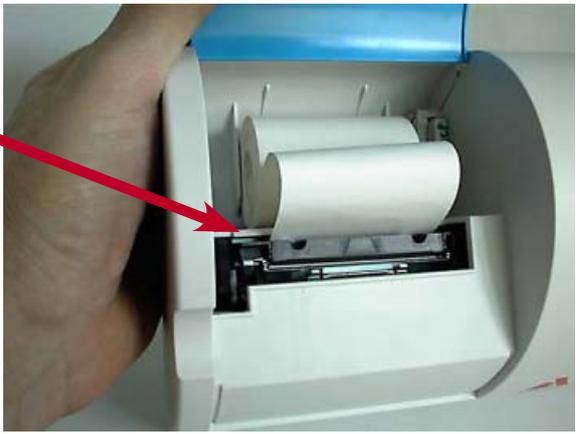|	*Operation*	*Figure*
7.3.1.	Disassemble the equipment.	According to points 7.1.1 – 7.1.6.
7.3.2.	Put aside the upper housing.	
7.3.3.	Unscrew the 2 pcs screw which fix the push button panel to the LCD frame. Remove plastic shim.	
7.3.4.	Note the position of the cables. Disconnect the cable (10p). (Put aside the panels and the cables.)	
7.3.5.	Connect the connector of the cable of the spare assembled push button panels to the connector of the "main" panel.	Figure according to point 7.3.4
7.3.6.	Screw in the 2 pcs screws which fixes the printer panel to the LCD frame. (2pcs PT KA 25x8)	According to the point 7.3.3
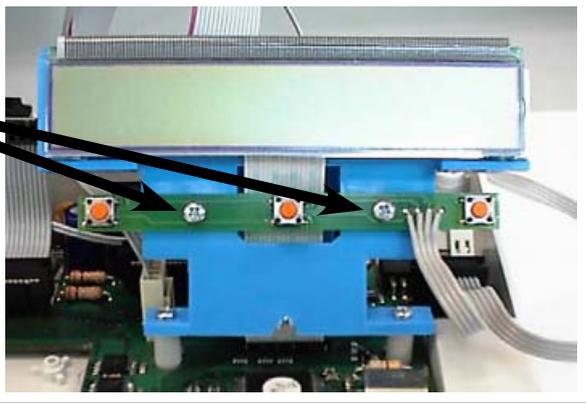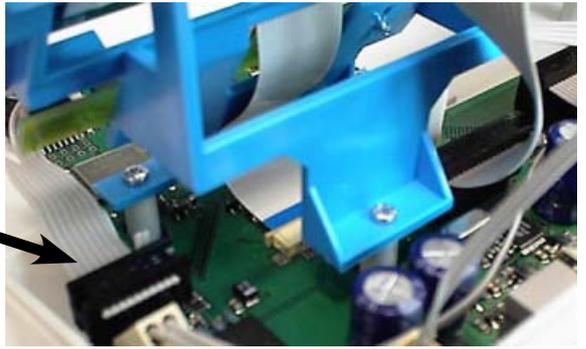
	Operation	*Figure*
7.3.7.	Insert the LED of the Start button into the housing (take care of the panel position), screw in the two screws fixing the panel (2 pcs PT KA 25x6) 	
7.3.8.	Assemble the equipment.	According to 7.1.9. - 7.1.13.
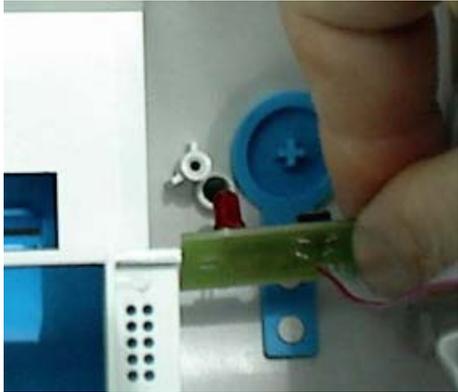
7.4. Replacement of printer and panel (UCP-4452-1)

	Operation	Figure
7.4.1.	Disassemble the equipment	According to 7.1.1. – 7.1.5.
7.4.2.	Place the upper housing behind the lower housing.	
7.4.3.	Unscrew the 4 screws which fix the printer and the PCB, lift the panel.	
7.4.4.	Disconnect both connectors from the printer PCB. Note the directions and routing of the cables! (2p and 16p)	
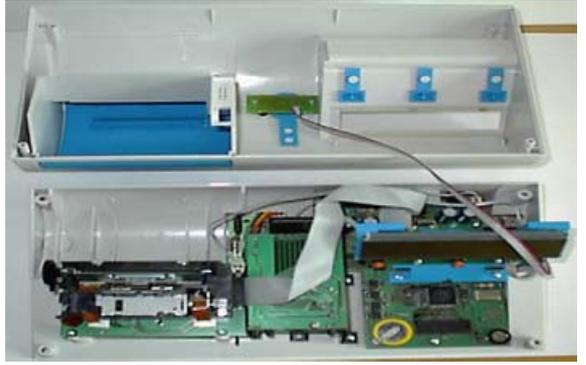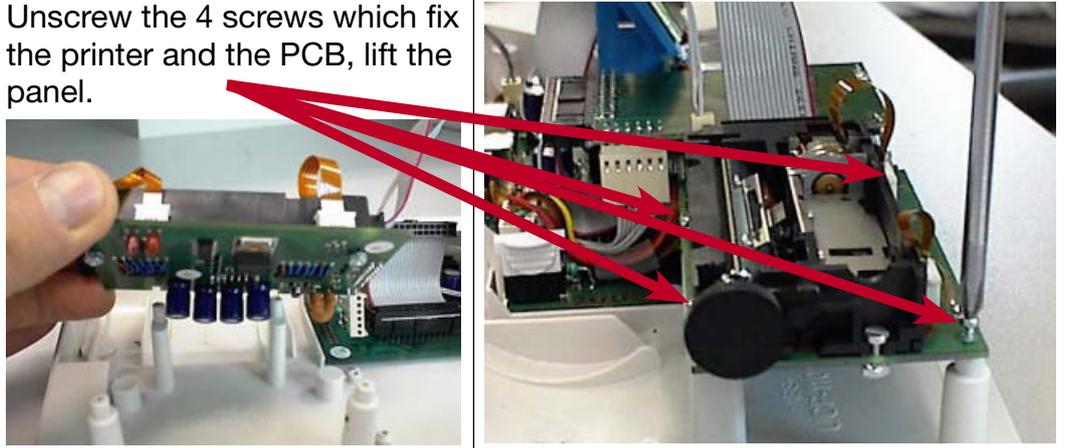
	Operation	*Figure*
7.4.5.	Connect the cables to the spare assembled printer panel. (2p and 16p)	Figure according to point 7.4.4.
7.4.6.	Place the printer panel onto its location. Screw in the two short screws (PTKA 22x6) into the front holes, then screw in the two longer screws (PTKA 22x8) onto the rear.	
7.4.7.	Assemble the equipment	According to the 7.1.9. – 7.1.13.
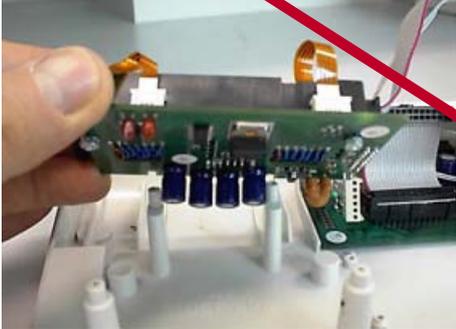
7.5. Feeding the printer paper (612EPL19)

	Operation	*Figure*
7.5.1	Open printer cover, insert paper roll into the holder.	
7.5.2	Insert the end of the printer paper into the slot located at the rear of the printer. After it paper feeding goes on automatically if the device is turned on. The edge of the paper must not be torn or uneven.	
7.5.3	Close the printer cover, stitch the end of the paper through the slot of the cover.	