

THERMAL & THERMAL TRANSFER
LABEL PRINTERS

models

witty 2000 EL7
&
witty 3001 GM EL7

USER MANUAL

 **Italora**

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Features and specifications are subject to change without notice

witty 2000 EL7 & witty 3001 GM EL7

GRAPHIC LABEL PRINTERS

1. GENERAL DESCRIPTION

These units offer an accurate and high quality printing moreover a formatting capability of 26 layouts in Flash memory. They can operate in dispensing mode, because of the inside mechanism for peeling and rewinding, or in strip form. Resident Bar Codes are dispensed at high

speed and the twentythree character generators with eighty magnifications give a wide range of fonts. The inside label unwind holder offers an autonomy of 1750 labels (54 x 40 mm), the modular design of these printers offers an easy service as well for electronic boards as for mechanics maintenance.

2. TECHNICAL SPECIFICATIONS

Printers of this family have obtained the IMQ approval according to European Standard EN 60950, and the EC type approval certificate n° UCM 01/001 – C according to the EN 45501 standard.

PRINTING

Method: Direct Thermal and Thermal Transfer
Resolution: 8 dots/mm, 384 dots/line (**witty 2000**)
12 dots/mm, 640 dots/line (**witty 3001**)
Print width: 51.1 mm (**witty 2000**)
54.2 mm (**witty 3001**)
Print speed: up to 150 mm/s
X/Y positioning of texts and bar codes
Texts and bar codes printed in four orthogonal directions
Lines, boxes, shadow and reverse printing
Graphic and logos: bit image mode
Bar Codes: EAN8, EAN13, 2/5, 2/5 I, 3/9, 2/7, DUN-14/16, UPC-A, UPC-B, UPC-E, CODE128, EAN128, Code 32, PZN, Code 93, PDF 417, Datamatrix, GS1 Databar, QR Code.
Automatic Check Digit computation
Wide/narrow ratio full programmable
Half, standard and double density
Height programmable
Suppression of human readable characters
Batch printing: up to 99.999.999 labels
Layouts: 26 programmable in Flash
Up to 10 protection levels for variable data printing
4 up/down 16 digits alphanumeric counters
Real Time Clock
Black intensity adjustable via software
Print button for last label repeating
THERMAL HEAD TEMPERATURE CONTROL
DATA TRANSFER INTERFACE
RS232/422/485: serial parameters settable by sw
USB, Ethernet (optional)
HANDSHAKE PROTOCOL
SW : XON/XOFF
HW : DTR
DATA TRANSMISSION
ASCII format
CHARACTER GENERATORS
5 fixed matrix), 6 proportionals
up to 112 customized
(see Programming Manual for further details)
Magnifications 9x9

MEMORY

32 – bit RISC microprocessor
8 MB flash
16 Mb RAM

DETECTORS

End of paper and feeding synchronism
End of thermal ribbon

PRINT MEDIA

Labels, tags and continuous paper

LABEL SIZES

Width: 30 mm min., 60 mm max
Length: 6 mm min.
2.280 mm max (**witty 2000**)
1.000 mm max (**witty 3001**)
Key: width min.: 2 mm
depth min.: 7 mm starting 2 mm min.
from the inner edge

ROLL SIZES

Width: 30 mm min., 60 mm max
Outer diameter: 130 mm max
Core diameter: 38 mm min.

THERMAL RIBBON

Base polyester film
Outer diameter: 58 mm max, length 220 meters
Width: 32 mm min., 54 mm max
Core diameter: 25.4 mm

PRINTER DIMENSIONS

Height: 170 mm; Depth: 380 mm
Length: 178 mm; Weight: 10 Kg

POWER REQUIREMENTS

Voltage: 115/230/240 Vac; 50-60 Hz
on request 110 Vac

ENVIRONMENT

Operating temperature: 0°/ 40° C
Storage temperature: -20°/60° C
Humidity: 10% - 95% non-condensing

OPTIONS

Label taken sensor
Guillotine
Pick & Place interface (optoisolated)
lines: one INPUT, two OUTPUT)
Ethernet interface, Wifi interface
ETIK wysiwyg label editor Windows based

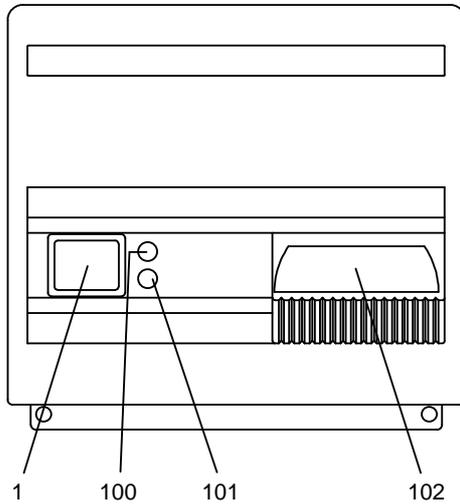
3. UNPACKING

Open the box and check the content :

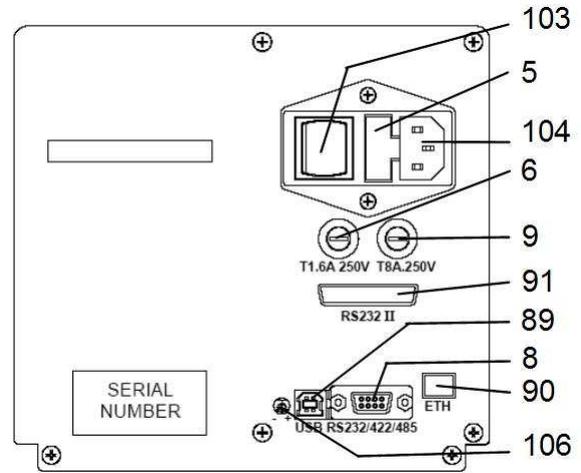
- a) **italora** label printer model **witty 2000** or **witty 3001 GM**
- b) power cable
- c) roll of labels

- d) roll of thermal ribbon
- e) printing tests
- f) serial cable RS232 and USB cable
- g) CD Rom with manuals and Etik Light

4. EXTERNAL DESCRIPTION



PICTURE 3



PICTURE 4

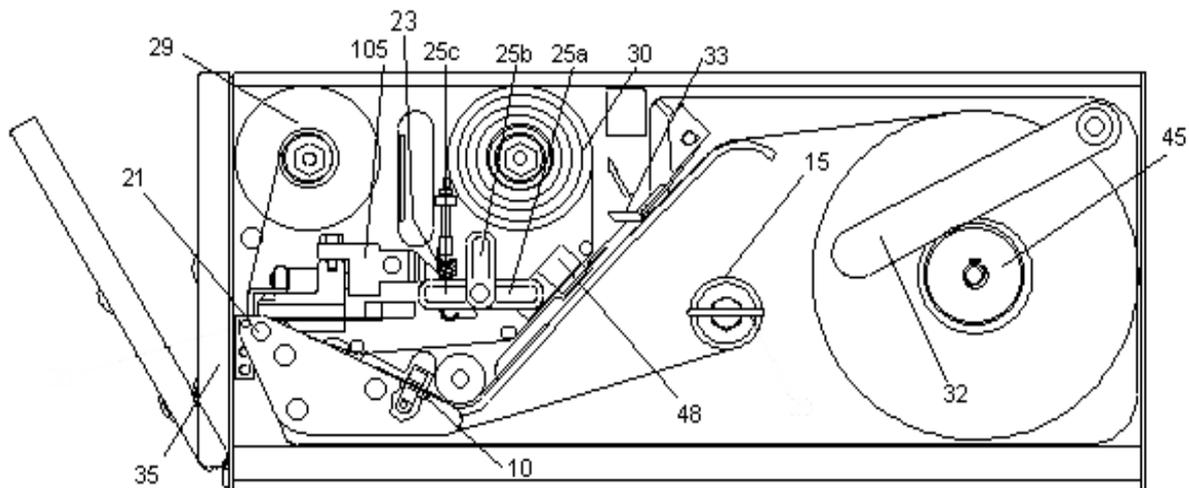
- 1: manual printing push button
- 100: **red led** => lit at POWER ON
- 101: **status led** =>
 - **lit green:** ON-LINE
 - **blinking green:** end of paper
 - **lit yellow:** syntax error (push printing button to restart)
 - **blinking yellow:** head temperature control active
 - **alternate green/yellow blinking:** end of ribbon
- 102 label output
- 5: 2 fuses 2AT (main))

- 6: 1 fuse 1.6AT (logic)
- 8: serial port
- 9: fuse 8AT (thermal head)
- 89 USB port
- 90 ETHERNET port (optional)
- 91 secondary serial port (optional)
- 103: main switch
- 104: power cord plug
- 106 trimmer for black intensity fine adjust
 - clockwise = more intensity
 - anticlockwise = less intensity

5. MAIN COMPARTMENT DESCRIPTION

(see following picture)

- 10 - photosensor for end of roll and label synchronisation
- 15 - rewinding shaft with adjusting clutch
- 18 - print head position fine adjustment
- 21 - rubber feeding roll
- 23 - print head assembly pressure spring
- 25 - lock / unlock lever
 - 25a - working position
 - 25b - open position
 - 25c - cleaning position
- 29 - thermal ribbon rewinder
- 30 - thermal ribbon stock
- 32 - label guide arm
- 33 - pressure clip
- 35 - front cover
- 45 - label unwind holder
- 48 - photosensor for end of thermal ribbon
- 105 - print head assembly



PICTURE 6

6. INCOMING INSPECTION

- * Open the main compartment
- * Check the presence of the label roll and of the thermal ribbon roll (TT model)
- * Check the correct pinout of the serial I/O Cannon 9 pins female connector (or of the USB connector) and connect the printer to the computer.
- * For further details see chapter "Connection to Host Computer".
- * Check the voltage on the name plate next to the power receptacle.
- * Lift the printhead down by rotating the lever #25a.
- * Switch the main switch on (rear panel) RED and GREEN leds ON mean operating conditions.
- * Push the PRINT BUTTON, you will get a printing test with the FIRMWARE release information.
- * Sending data from the computer you will get the first printing.
- * Push the PRINT BUTTON to get the last printing again; the printer keeps the information of the last printing until next data arrive.

* Connect the power cable to a grounded power line

NOTE: **Printer retains the label length and the backing paper transparency in permanent memory.**

In case of change of print media see the following paragraph.

6.1. LABEL FORMAT SET UP PROCEDURE

(see pictures 7 and 8)

The printer retains the label length and the backing paper transparency in permanent memory. **If changing label format or print media type** you have to use the following procedure to update the values:

- 1 - Switch the printer off.
- 2 - Lift the printing head up by rotating lever #25b.
- 3 - Thread the web between the feed roller and the printig head #21,105.
- 4 - Check web has been rightly positioned under the label photosensor #10.
- 5 - Lift the printing head down by rotating the lever #25a.
- 6 - Switch the printer on while pushing the print button.
- 7 - Printer ejects some labels (depending on their length) and stores the values of the media.
- 8 - Release the print button.
- 9 - The green led lit and the printer is ready to work.

For further information about media options see chapter 7 and the paragraph "Labels, tags and continuous media printing" of the PROGRAMMING MANUAL.

7. PRINTING MEDIA DESCRIPTION

7.1 PAPER SPECIFICATIONS

White coated glossy printing paper
- weight: 65 ÷ 90 g/mq (ISO536)
- caliper: 0,075 ÷ 0,083 mm (ISO534)

ADHESIVE SPECIFICATIONS

- peel adhesion(90° C): 430 N/m
- service temperature: -20° C ÷ + 70° C

LINER SPECIFICATIONS

- BG 40 brown, supercalendered glassine
- weight: 65g/mq (ISO536)
- caliper: 0.057 mm (ISO534)
- transparency: 45%

TAGS AND CONTINUOUS STRIPS

- weight: 200 g/mq max

SUGGESTED MODELS

- Fasson Fasthermal NT
- Kanzaki KPT 86-H
- Fasson Fastransfer MP - S470
- Fasson Fastransfer Extra - S470

LABEL AND TAGS DIMENSIONS

See Chapter 2

7.2. THERMAL RIBBON SPECIFICATIONS

- film thickness 4.5 ÷ 6 micron
- core diameter: 25.4 mm
- outer diameter: 58 mm max
- width: 32 mm min/ 54 mm max
- length: about 220 meters (58 mm DIA. max)
- ink coating outside

SUGGESTED MODELS

- TOIKO C 250 (matt paper)
- TOIKO CR 150 (glossy paper and polypropylene)
- TOIKO R 300 (plastic media)

STORAGE

Keep labels and ribbons in a dry place at temperature not over 40° C and not exposed to direct sun light.

8. THERMAL RIBBON AND LABEL ROLL REPLACEMENT

8.1. THERMAL RIBBON REPLACEMENT

(see picture 7)

Open side of printer.

Remove the used roll. Remove the core #47 from the shaft and put it on the rewinder #29.

By rotating the lever #25b, lift the printing head #105 from the feed roller #21, setting the movement of the ribbon free.

Slide new ribbon #43 onto shaft and thread it under the ribbon photosensor #48 and the threaders #108,107 and 37 and up round to the rewinder #29. Attach the ribbon leader with label/tape to core #47. Return head lever to closed position #25a. Close side of printer.

8.2. LABEL ROLL REPLACEMENT

In case of changing of label format or printing media type, remember to follow the "Label format set up procedure" shown on paragraph 6.1.

8.2.1. DISPENSING MODE

(see picture 8)

Open side of printer.

Remove the empty label roll.

Lift guide arm #32.

Insert new label roll onto roller #45

Bring the guide arm #32 down and push it tightly against the side of the label roll.

By rotating the lever #25b, lift the printing head #105 from the feed roller #21, setting the movement of labels and ribbon free.

Remove clip #28 from the rewinding shaft #15.

Remove backing paper from the rewinding shaft.

Remove the first 50 centimetres from liner of the new roll labels.

Hold pressure clip #33 up and feed the liner through the path, slide it on the rewinder unit #15 and fasten it with the clip holder #28.

Turn the rewinder to stretch the paper.

Turn head lever back to closed position #25a.

Check paper has been rightly positioned under the label photosensor #10.

Check pressure clip #33 has been positioned between centre and outer side of the label.

Close side of printer.

8.2.2. STRIP FORM MODE

(see picture 9)

Open side of printer.

Remove the empty label roll.

Lift up the guide arm #32.

Insert new label roll onto roller #45

Bring the guide arm #32 down and push it tightly against the side of the label roll.

By rotating the lever #25b, lift the printing head #105 from the feed roller #21, setting the movement of labels and ribbon free.

Hold pressure clip #33 up and feed the paper through the path.

Turn head lever back to closed position #25a.

Check paper has been rightly positioned under the label photosensor #10.
 Check pressure clip #33 has been positioned between

centre and outer side of the label.
 Close side of printer.

8.2.3. REWINDING MODE (see pictures 10 and 11)

Is necessary to rewind printed labels inside option P/N 801620098 (see picture 11).

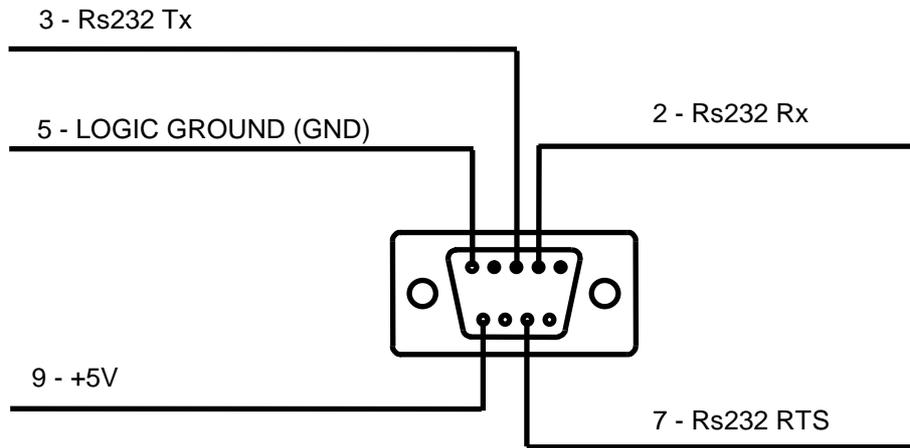
Open side of printer.
 Remove the empty label roll.
 Lift guide arm #32.
 Insert new label roll onto roller #45
 Bring the guide arm #32 down and push it tightly against the side of the label roll.
 By rotating the lever #25b, lift the printing head #105 from the feed roller #21, setting the movement of labels and ribbon free

Remove clip #28 from the rewinding shaft #15.
 Hold pressure clip #33 up and feed the paper through the path, slide it on the rewriter unit #15 and fasten it with the clip holder #28.
 Turn the rewriter to stretch the paper.
 Turn head lever back to closed position #25a.
 Check paper has been rightly positioned under the label photosensor #10.
 Check pressure clip #33 has been positioned between centre and outer side of the label.
 Close side of printer.

9. CONNECTION TO HOST COMPUTER

9.1 SERIAL INTERFACE

witty 2000 EL7 and **3001GM EL7** printers have a RS232/422/485 hardware interface. Provided on board connector is a Cannon 9 pins "DB" female cabled as shown in the following pictures.



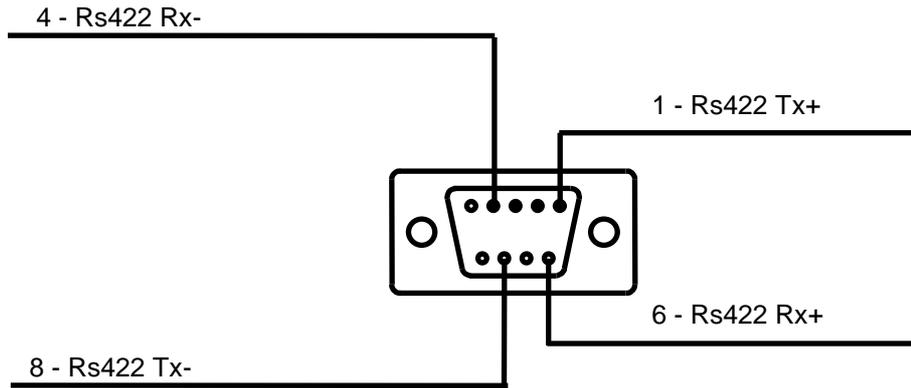
Connection to personal computer may be done in different ways:

COMPUTER CONNECTOR - 9 PIN		COMPUTER CONNECTOR - 25 PIN	
COMPUTER	PRINTER	COMPUTER	PRINTER
2	3 TX	3	3 TX
3	2 RX	2	2 RX
8	7 RTS	5	7 RTS
5	5 GND	7	5 GND

COMPUTER CONNECTOR:		COMPUTER CONNECTOR:	
-using sw protocol XON/XOFF:		-using sw protocol XON/XOFF:	
short together PINS 7-8 and 1-4-6.		short together PINS 4-5 and 6-8-20.	
-using hw protocol CTS/RTS:		-using hw protocol CTS/RTS:	
short together PINS 1-4-6.		short together PINS 6-8-20.	

Rs422 – DB9 CONNECTOR

Connector pinout is



HANDSHAKE PROTOCOL

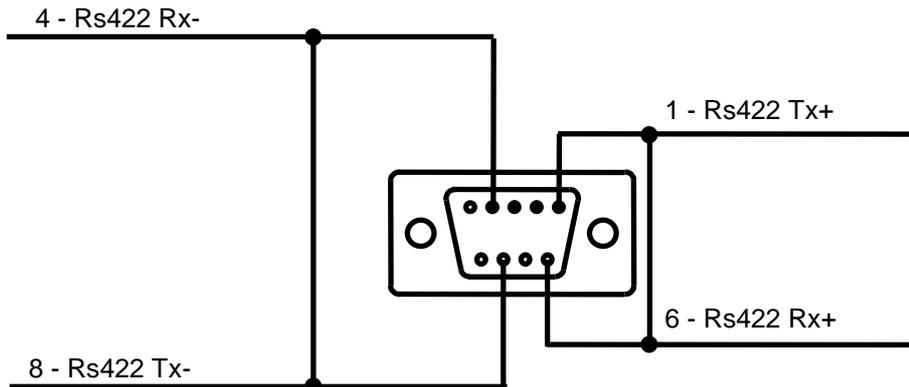
Rs422 serial line has no handshake protocol.

It means that if you transmit more than 2 / 3 KBytes of data at a time it's strongly recommended to insert a short delay (1 or 2 msec) between transmission of each character, in order to avoid printer errors during data receiving; alternatively software XON / XOFF handshake mode may be used.

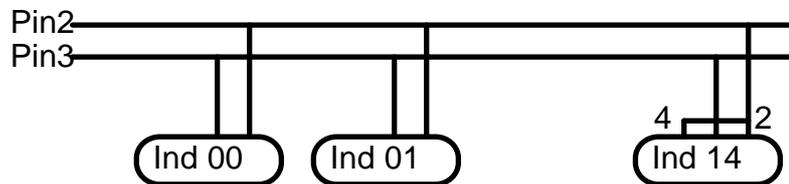
Connection to personal computer may be done in different ways based on used converter.

Rs485 – DB9 CONNECTOR

Connector pinout is



Maybe you'll need to do a short circuit between pins 2 and 4 on printer side connector, in order to enable the line terminator resistance (already included on the cpu board).



HANDSHAKE PROTOCOL

RS 485 serial line has no handshake protocol.

In fact CTS printer signal, normally used in RS232 serial line to stop data transmission, is used here to set up the direction of data stream.

It means that if you transmit more than 2 / 3 KBytes of data at a time it's strongly recommended to insert a short delay (1 or 2 msec) between transmission of each character, in order to avoid printer errors during data receiving. Connection to personal computer may be done in different ways based on used converter.

10. MAINTENANCE

WHEN NOT IN USE:

- SWITCH OFF POWER
- ALWAYS LIFT UP THE PRINTER HEAD

10.1. CLEANING

Print Head

- Turn the power off.
- Wait until thermal head cools down.
- Lift the print head by using the lever on position 25c
- Remove labels and thermal ribbon.
- Moisten a cotton cloth with denatured alcohol.
- Polish the below side to remove incidental adhesive traces or parts of labels
- Wait until dry before use

WARNING: never use hard tools as this may damage the print head.

Rubber feeding roll: use alcoholic detergents.

Photosensor: use a soft brush.

Metallic and plastic parts: use a soft cloth with water-based detergent (weak).

Removing adhesive traces or parts of labels: use alcoholic detergents. Be careful the liquid does not drip on the electronic compartment.

11. TROUBLE SHOOTING

11.1. NO LABELS FEEDING

Four situations may occur.

a) RED led is OFF, check (pict.3,#100):

- main voltage
- main switch (pict.4,#103) ON.
- main connector (pict.4,#104) plugged in
- main fuses (pict.4,#6) intact.

b) RED led is ON, STATUS led is BLINKING GREEN, check:

- label roll is not used up.
- paper position under the photosensor (pict.8,#10)

c) RED led is ON, STATUS led is BLINKING alternately GREEN and YELLOW, check:

- thermal ribbon is not used.
- thermal ribbon position under the photosensor (pict.7,#48).

d) RED led is ON, STATUS led is BLINKING YELLOW:

- head temperature control active, printer stops until temperature has fallen to normal values.

11.2. INCORRECT LABEL ALIGNMENT

Make sure that:

- print head is closed (pict.6,#25a)
- paper position under the photosensor (pict.8,#10)
- backing paper is correctly rewound (pict.6,#15)
- pressure clip (pict.6,#33) is positioned

between centre and outer side of the label.

- guide arm (pict.6,#32) is tightly pushed against the side of the label roll.

See also "Label format set up procedure" paragraph 6.1

11.3. PAPER SLIDES TO RIGHT SIDE

Check whether:

- pressure clip (pict.6,#33) is positioned between centre and outer side of the label.

- guide arm (pict.6,#32) is closely positioned against the side of the label roll.

11.4. PRINTING WITH PATCHES MISSING

Check whether:

- thermal print head needs cleaning (chapter 11)
- thermal ribbon unwinds correctly.

- there are creases on the rewound thermal ribbon. If so, turn the nut (pict.7,#110) clockwise, in order to increase the rewinding torque (a quarter of a turn max) while holding the roller (pict.7,#29) still.

11.5. BLANK LABELS

Check whether

- the fuse (8AT) on the back panel has blown
- the print head connector is correctly plugged in

(pict.13,#112) with polarity key up.

- thermal ribbon is correctly positioned, opaque surface on the label side.

11.6. POOR PRINTING CONTRAST

- See printer rear panel.
- turn the print head screw (pict.4,#106) for temperature fine adjustment :
 - clockwise to make print darker.
 - anticlockwise to make print lighter.

Otherwise use the software command ?77& (see Programming Manual).

BEWARE: continual high operating temperature of thermal head may reduce its working life and may also fuse the ribbon.

11.7. LABELS ARE NOT CORRECTLY PEELED OFF

(DISPENSING MODE)

- Make sure the label adhesive respects the specifications (see chapter 8).
- Turn the nut (pict.16,#113) clockwise, in order to

increase the rewinding torque (a half of a turn max) while holding the roller (pict.16,#15) still.

BEWARE: excessive torque may cause incorrect labels alignment.

12. HARDWARE NOTES

12.1. HOW TO CHECK ELECTRONIC BOARDS

- **First unplug the power cable from the printer.**
- open side of printer
- remove the front panel (pict.17,#35), turning the 2 screws (pict.17,#114,115) and the side screw (pict.19,#116) out.
- turn the 2 rear panel screws (pict.18,#117,118) and the 3 side screws (pict.19,#119,120,121) out.
- pull carefully off the electronic cabinet from the printer chassis and unplug the following connectors from CPU board (pict.21 or 21 bis).

Y2 = ribbon photosensor
Y3 = leds and push button
Y4 = stepping motor
Y5 = label photosensor
Y9 = thermal head (8 dots)

YGM = thermal head (12 dot GM)

Y15 = thermal head (12 dots GM)

- disconnect the ground cable turning the chassis nut out.

12.2. ELECTRONIC BOARDS REPLACEMENT

Unplug the following connectors from the CPU board (pict.21):

Y7 = serial interface

Y30 = power supply

- turn the lock screw out (pict.20,#113) and pull out the CPU board (pict.20,#50).
- turn the 4 rear panel screws

(pict.18,#122,123,124,125) out.

- unplug the fuses connectors and the main switch connector.
- turn the 2 lock screws (pict.20,#126,127) out.
- pull the power supply (pict.20,#13) out.

12.3. PRINT HEAD PROTECTION FUSE REPLACEMENT

- Thermal print head is protected by an 8 A timed fuse (pict.4,#9).

12.4. THERMAL PRINT HEAD REPLACEMENT

(see picture 27)

- 1 switch the printer off .
- 2 unplug the connector(s) #112 from the print head.
- 3 lift print head by rotating the lever #25c.
- 4 turn the screw #130 out.
- 5 remove the adjusting nut #18 and the retaining ring #137.
- 6 pull out the print head and dissipater assembly from the pivot pin.
- 7 turn the screw #138 out and remove the print head #26 from the dissipater.
- 8 replace thermal head and run back steps 7 to 2.

WARNING: pay attention to plug in correctly the thermal head connector, wrong connection causes irreversible damage to the print head functionality (pict. 13)

9 in case of printing quality problems, loosen the screw #130 and turn slowly the adjusting nut in or out #18, for the best printing quality, finally lock the screw #130.

10 in case of creases on the rewound thermal ribbon, loosen the screws #128,129 and adjust the plate #37 in order to obtain a correct parallelism and flatness on the rewound ribbon; finally lock the screws #128,129.

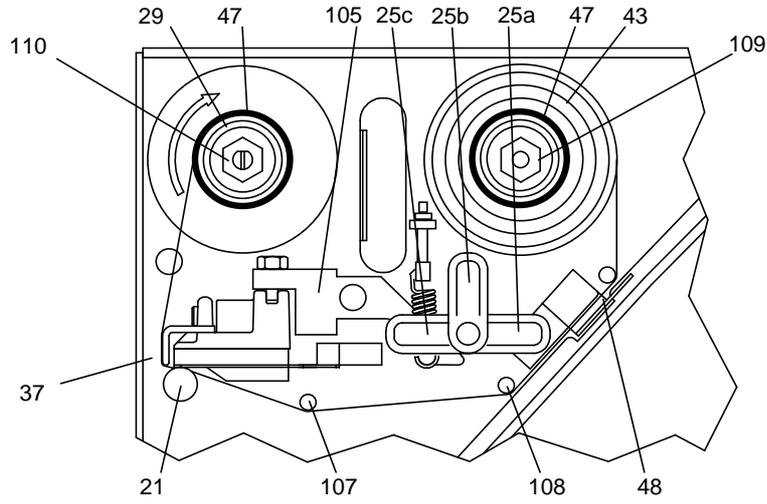
12.5. DRIVE BELT REPLACEMENT

(see picture 28 and 29)

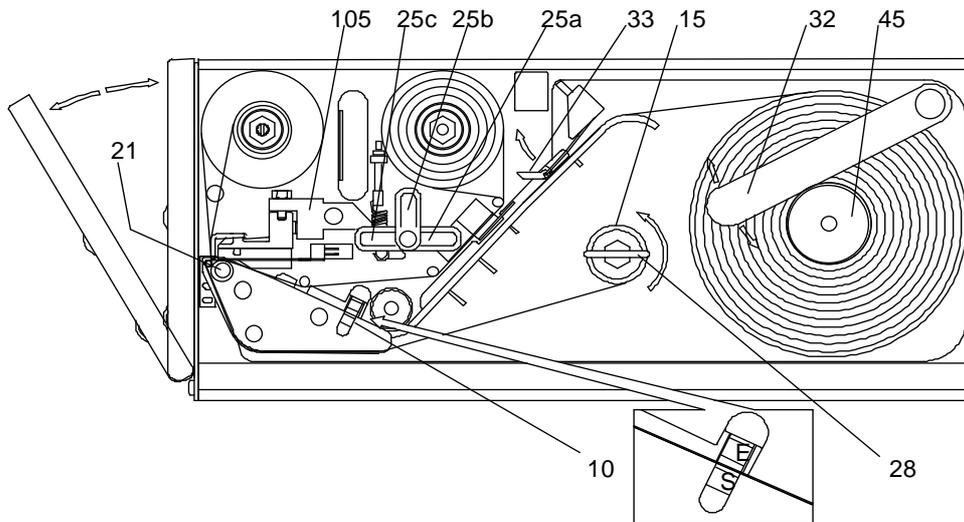
Disassemble the electronic cabinet from the printer chassis as shown in paragraph 14.1, remove the 3 screws #131,132,133 and the safeguard plate #134,

then loosen the idler #16. Replace the belt and stretch it by the idler till you get a deflection of 4 to 6 mm when applying a force of 7 N.

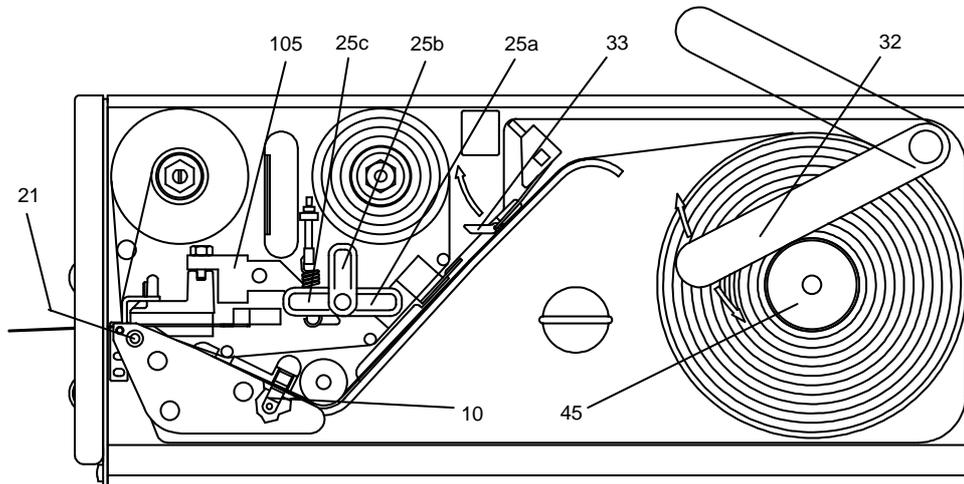
13. PICTURES



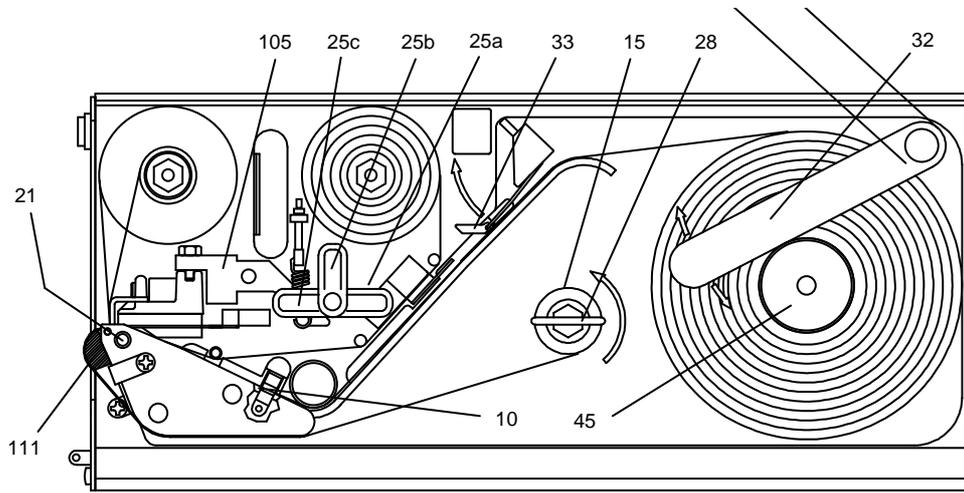
PICTURE 7



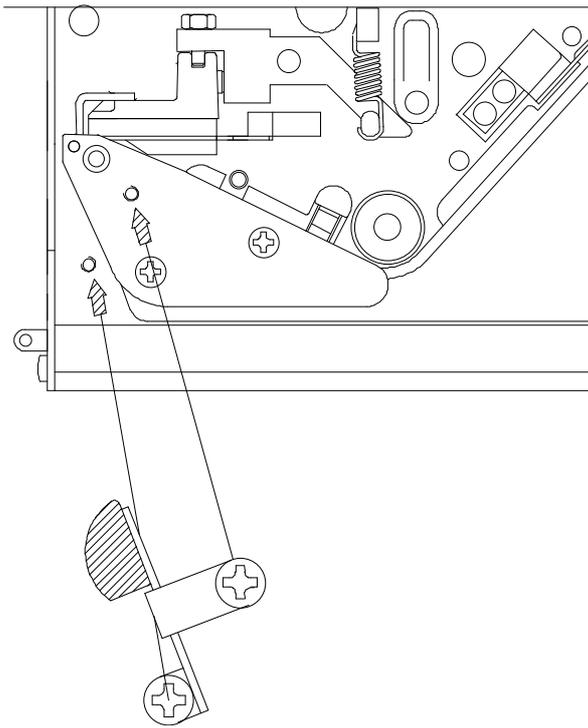
PICTURE 8



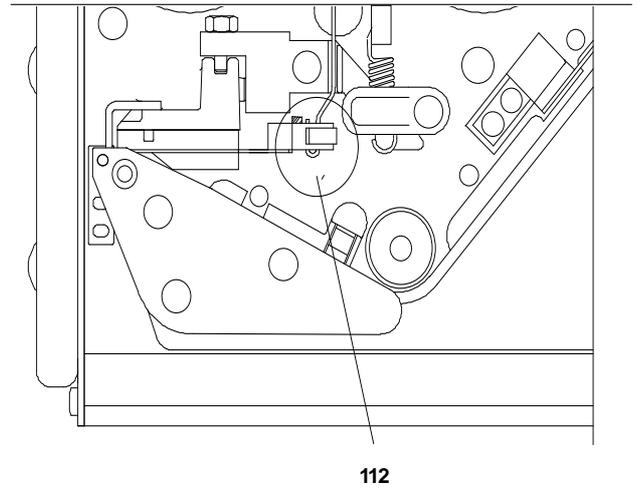
PICTURE 9



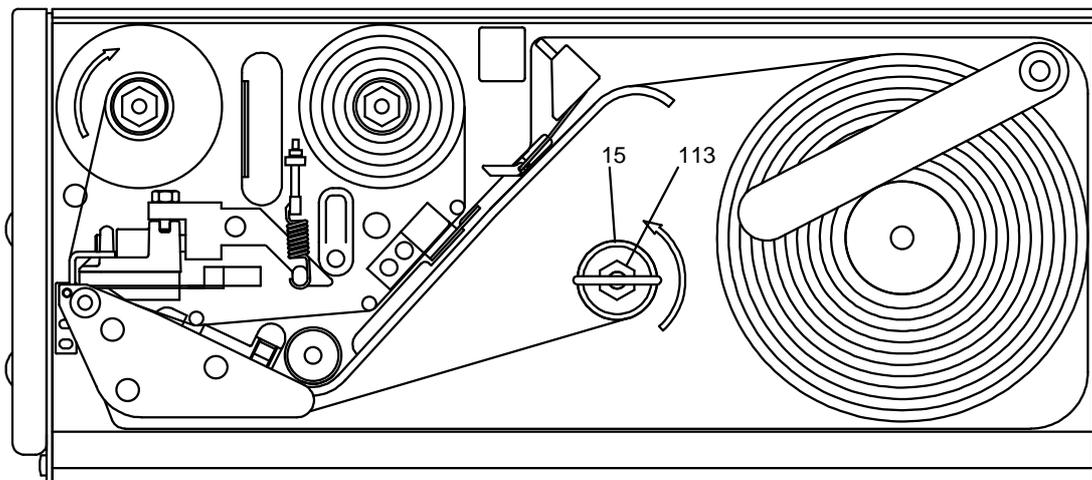
PICTURE 10



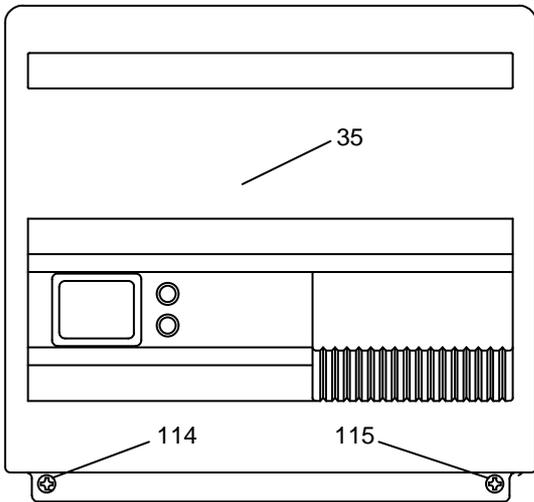
PICTURE 11



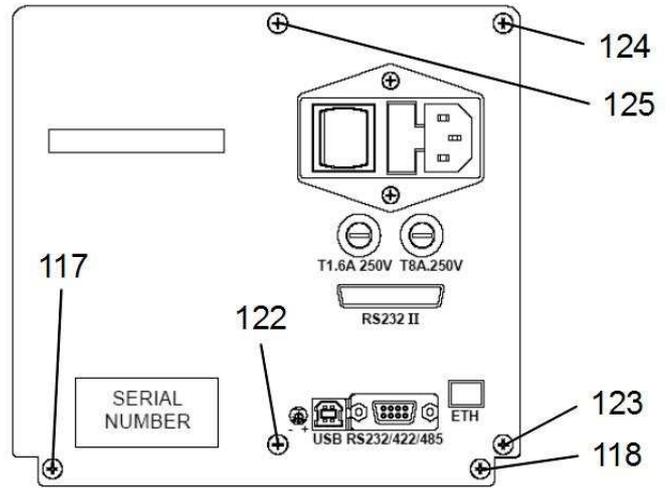
PICTURE 13



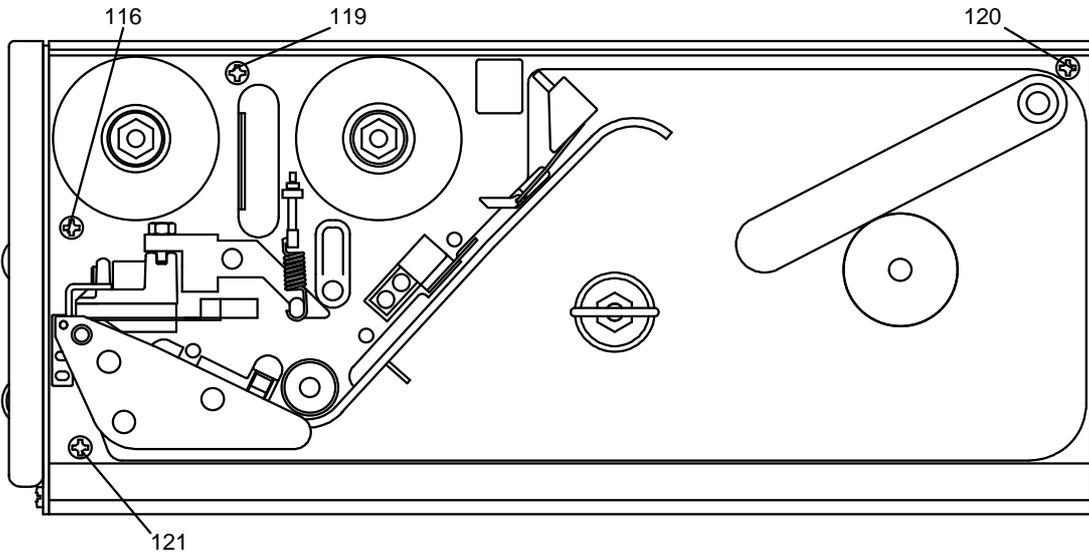
PICTURE 16



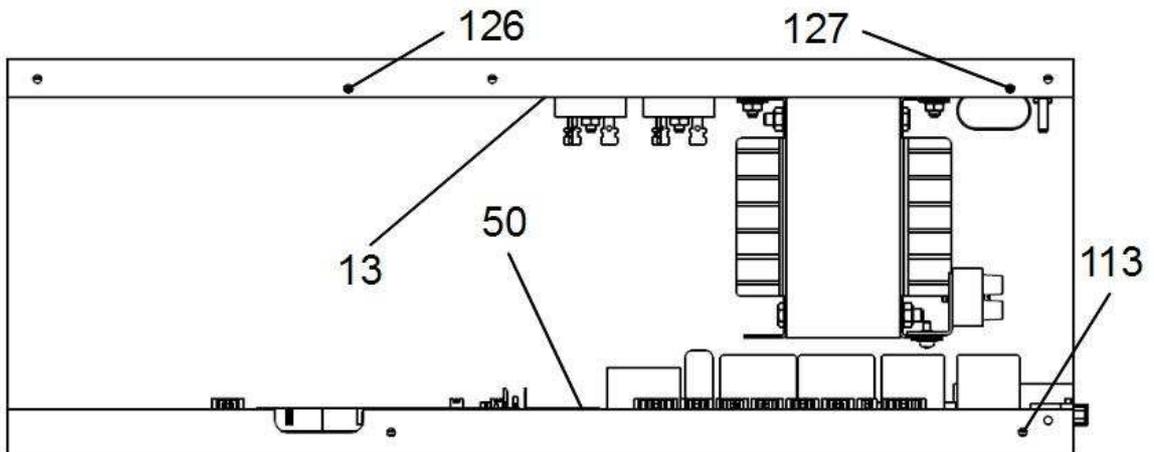
PICTURE 17



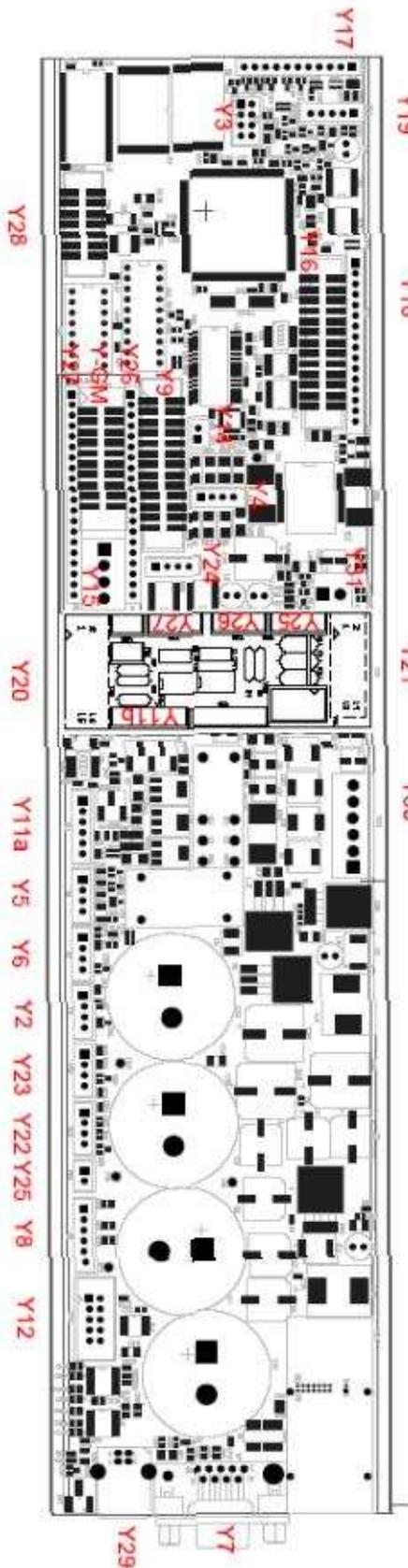
PICTURE 18



PICTURE 19



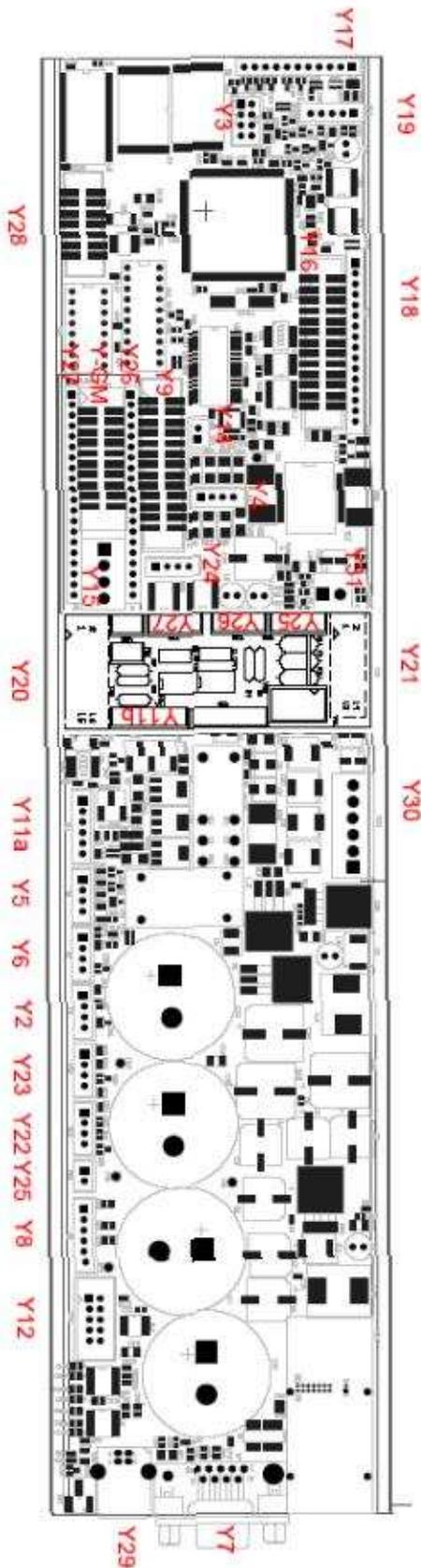
PICTURE 20



witty 2000 EL7

- Y1 Cutter
- Y2 Ribbon sensor
- Y3 Push button, Leds
- Y4 Motor
- Y5 Label sensor
- Y6 Label taken sensor
- Y7 Serial port
- Y8
- Y9 Thermal head 8 dots
- Y10
- Y11 Optocouplers
- Y12
- Y13
- Y14
- Y15
- Y16
- Y17
- Y18
- Y19
- Y20
- Y21
- Y22
- Y23
- Y24
- Y25
- Y26
- Y27
- Y28
- Y29
- Y30 Power supply

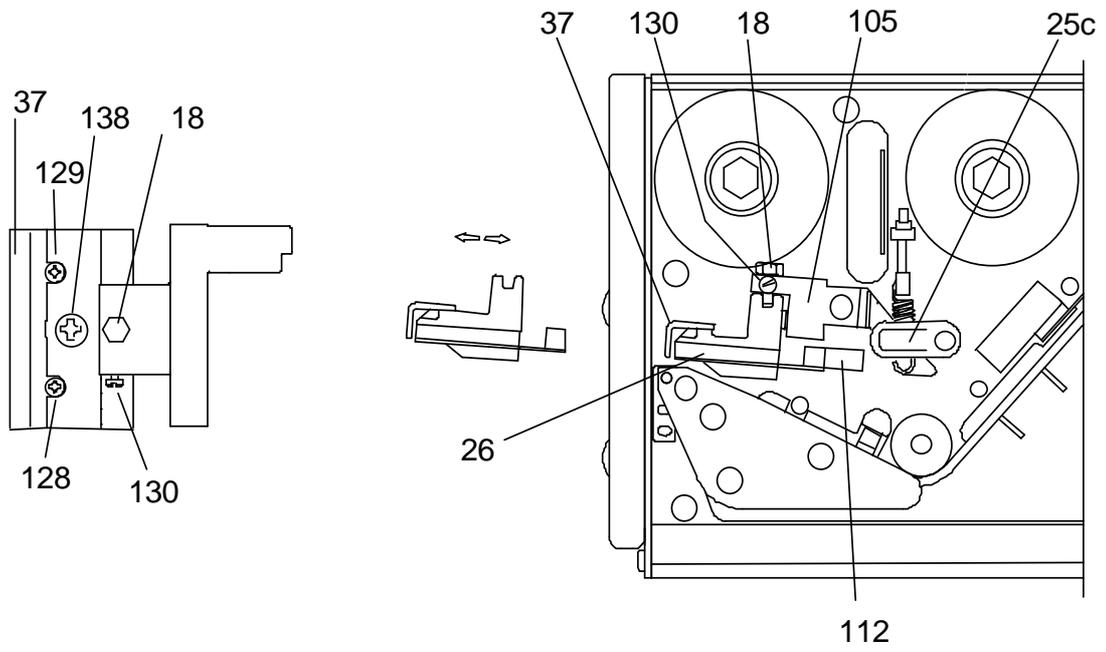
PICTURE 21 LOGIC BOARD - layout



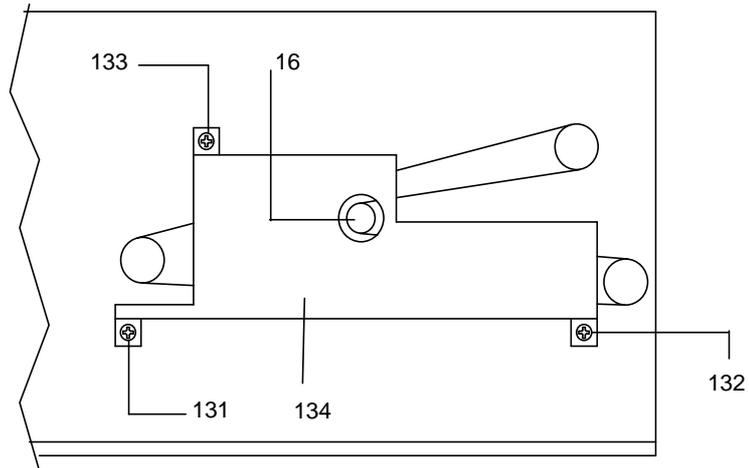
witty 3001GM EL7

Y1	Cutter
Y2	Ribbon sensor
Y3	
Y4	Motor
Y5	Label sensor
Y6	Label taken sensor
Y7	Serial port
Y8	
Y9	
Y10	
Y11	Optocouplers
Y12	
Y13	
Y14	
Y15	Thermal head 12 dots
YGM	Thermal head 12 dots
Y16	
Y17	
Y18	
Y19	
Y20	
Y21	
Y22	
Y23	
Y24	
Y25	
Y26	
Y27	
Y28	
Y29	
Y30	Power supply

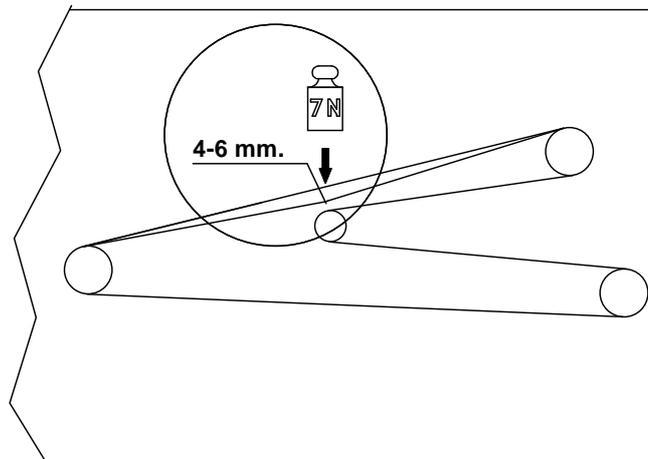
PICTURE 21 bis LOGIC BOARD - layout



PICTURE 27

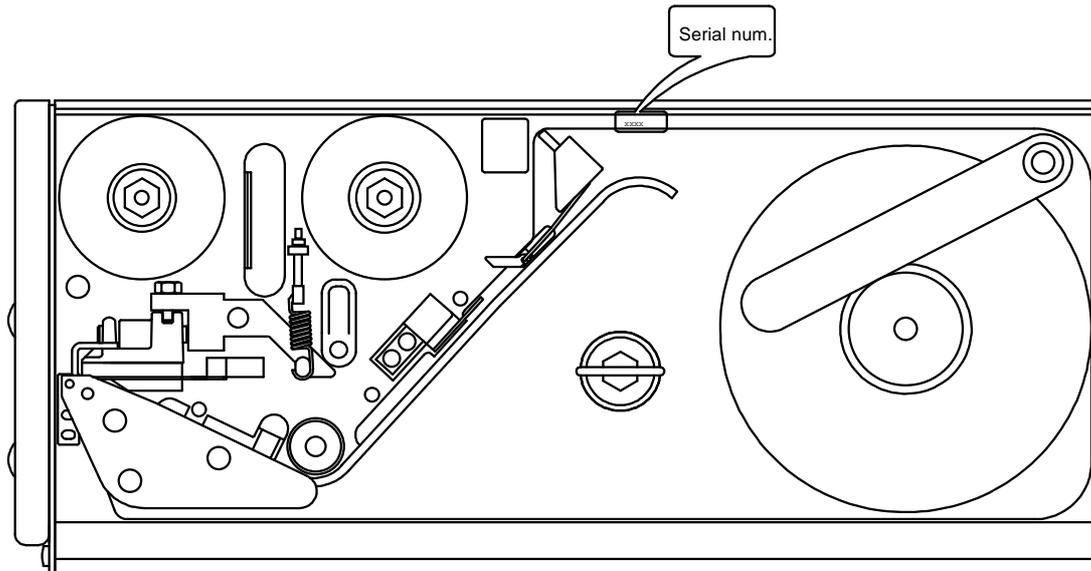


PICTURE 28



PICTURE 29

14. PART LIST AND RELEVANT PICTURES



Spare parts list

(items are referred to following pictures)

ITEM	CODE	DESCRIPTION	witty 2000 EL7	witty 3001 GM EL7
3	800944140	rear panel	*	*
4	801292050	filter cap	*	*
5	056102080	fuse 2A T	*	*
6	056102020	fuse 1.6A T	*	*
9	056102030	fuse 8A T	*	*
10	801295040	label photosensor	*	*
12	801665210	print head flat cable 26 wires	*	
12	051507660	print head flat cable 20 wires		*
12	051507650	print head power cable		*
13	800944080	power board	*	*
15	800925090	rewinding assembly	*	*
16	800925310	belt idler assembly	*	*
18	801312400	nut	*	*
19	061702050	bush	*	*
20	800926080	peeling shaft assembly	*	*
21	801312130	feeding roller	*	*
23	800742100	spring	*	*
24	801682010	pinion	*	
24	801312220	pinion		*
25	800925880	print head lever	*	*
26	800822040	thermal print head (8 dots)	*	
26	800822650	thermal print head (12 dots GM)		*
28	801312440	clip holder	*	*
29	800942670	ribbon rewinding assembly	*	*
30	800942680	ribbon stock assembly	*	*
31	801622034	side cover	*	*
33	810940029	media position holder assembly	*	*

ITEM	CODE	DESCRIPTION	witty 2000 EL7	witty 3001 GM EL7
34	801872020	pinion	*	
34	801312220	pinion		*
35	800948070	grey-green front cover	*	*
36	801622013	cabinet	*	*
37	801622040	ribbon plate	*	*
38	801622100	belt	*	*
39	801622160	ribbon rewinding gear	*	*
40	801842501	tie rod	*	*
48	801625030	ribbon photosensor	*	*
49	800946230	stepping motor assembly	*	
49	801625050	stepping motor assembly		*
50	80087700003	CPU board	*	
50	800877000A2	CPU board GM		*
51	800926630	heat dissipater assembly	*	
51	800927550	heat dissipater assembly GM		*

