

THERMAL & THERMAL TRANSFER
LABEL PRINTERS

models

smart 2000/280

USER MANUAL



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Features and specifications are subject to change without notice

smart 2000/280

GRAPHIC LABEL PRINTERS

1. GENERAL DESCRIPTION

These units offer an accurate and high quality printing moreover a formatting capability of 5 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 eight character generators with eighty magnifications give a wide range of fonts.

The inside label unwind holder offers an autonomy of 1500 labels (106 x 70 mm), the modular design of these printers offers an easy service as well for electronic boards as for mechanics maintenance.

Printers of this family have obtained the IMQ approval according to European Standard EN 60950.

2. TECHNICAL SPECIFICATIONS

PRINTING

Method: Direct Thermal and Thermal Transfer
8 dots/mm, 832 dots/line

Print width: 104.0 mm

Print speed: up to 120 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, CODE 128, EAN 128,

EAN13+ADDON

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 9999 labels

Layouts: 5 programmable in Flash, 50 fields each

Up to 10 protection levels for variable data printing

4 up/down 16 digits counters

Real Time Clock

Black intensity adjustable via software

Print button for last label repeating

THERMAL HEAD TEMPERATURE CONTROL

DATA TRANSFER INTERFACE

RS232: serial parameters settable by sw

USB

HANDSHAKE PROTOCOL

SW : XON/XOFF

HW : DTR

DATA TRANSMISSION

ASCII format

CHARACTER GENERATORS

Micro (fixed matrix) 5x5

Standard (fixed matrix) 7x5

Draft (fixed matrix) 8x13

Big (fixed matrix) 16x24

New Century (proportional) 45

Arial (proportional) 32

Motor (fixed matrix) 32x48

Compact (proportional) 19

Magnifications 9x9

CHARACTER SIZES

0.62 x 0.66 mm minimum

36.00 x 57.00 mm maximum

MEMORY

32 – bit RISC microprocessor

4 MB flash

8 Mb RAM

DETECTORS

For end of paper and feeding synchronism

For end of thermal ribbon

PRINT MEDIA

Labels, tags and continuous strips

LABEL SIZES

Width: 30 mm min., 110 mm max

Length: 10 mm min.

303 mm max

Key: width min.: 2 mm
depth min.: 7 mm starting 2 mm min.
from the inner edge

ROLL SIZES

Width: 30 mm min., 110 mm max

Outer diameter: 150 mm max

Core diameter: 38 mm min.

THERMAL RIBBON

Base polyester film

Outer diameter: 58 mm max, length 220 meters

Width: 35 mm min., 110 mm max

Core diameter: 25.4 mm

PRINTER DIMENSIONS

Height: 200 mm; Depth: 440 mm

Length: 235 mm; Weight: 17 Kg

POWER REQUIREMENTS

Voltage: 220/240 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

ETIK wysiwyg label editor Windows based

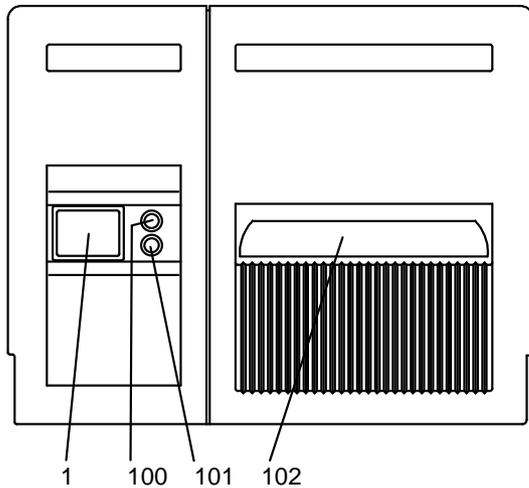
3. UNPACKING

Open the box and check the content :

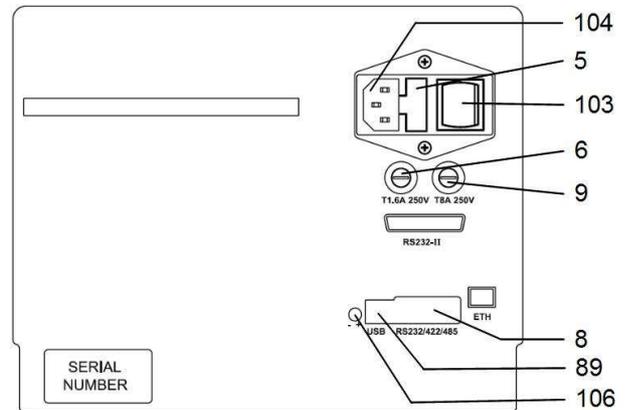
- a) **italora** label printer model **smart 2000/280**
- b) power cable

- 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

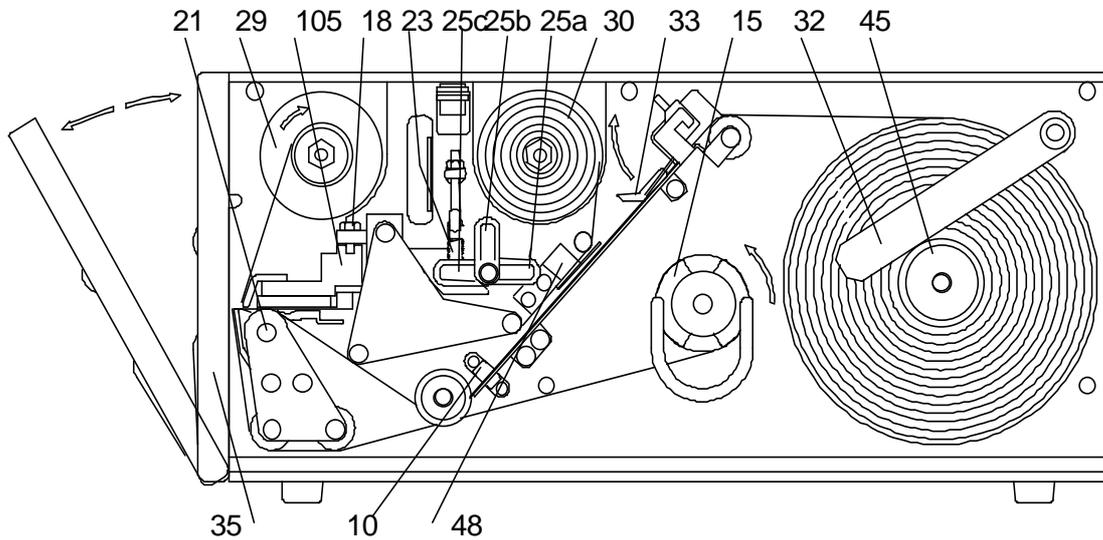
- 1: manual printing push button
- 100: **red led** => lit at POWER ON
- 101: **green status led** =>
 - **lit:** ON-LINE
 - **blinking:** end of paper
 - end of ribbon
 - **off:** syntax error (push printing button to restart)
 - head temperature control active
- 102 label output
- 5: 2 fuses 2AT (main)

- 5: 2 fuses 2AT (main))
- 6: 1 fuse 1.6AT (logic
- 8: serial port
- 9: fuse 8AT (thermal head)
- 89 USB port
- 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
- * 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.
- * Connect the power cable to a grounded power line
- * 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.

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 Fastthermal 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: 35 mm min/ 110 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 picture 10 and 11)

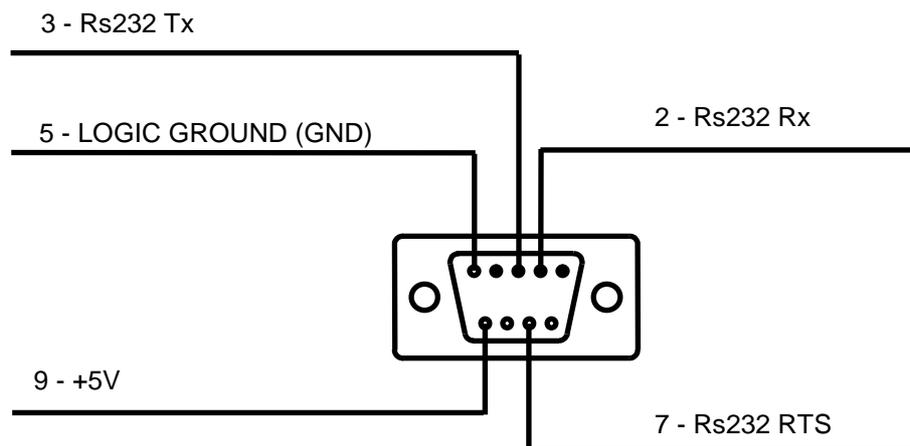
Is necessary to rewind printed labels inside to remove the plate #20, turning the screws #139,140 out.

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 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.

9. CONNECTION TO HOST COMPUTER

smart 2000/280 printers have a RS232 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: -using sw protocol XON/XOFF: short together PINS 7-8 and 1-4-6. -using hw protocol CTS/RTS: short together PINS 1-4-6. | | COMPUTER CONNECTOR: -using sw protocol XON/XOFF: short together PINS 4-5 and 6-8-20. -using hw protocol CTS/RTS: short together PINS 6-8-20. | |
|--|--|--|--|

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, GREEN STATUS led is BLINKING check:

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

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

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

d) RED led is ON, GREEN STATUS led is OFF:

- 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 10)
- 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 7).
- Turn the nut (pict.16,#41) clockwise, in order to increase the rewinding torque (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 6 side screws (pict.19,#114,115,116, 119,120,121)
- turn the 2 rear panel screws (pict.18,#117,118) out.
- pull carefully off the electronic cabinet from the printer chassis and unplug the following connectors from CPU board (pict.21).

Y2 = ribbon photosensor

Y3 = leds and push button

Y4 = stepping motor

Y5 = label photosensor

Y9 = thermal head

- 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 4 rear panel screws (pict.18,#122,123,124,125) out.

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

- 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 flat connector #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.
- 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 .

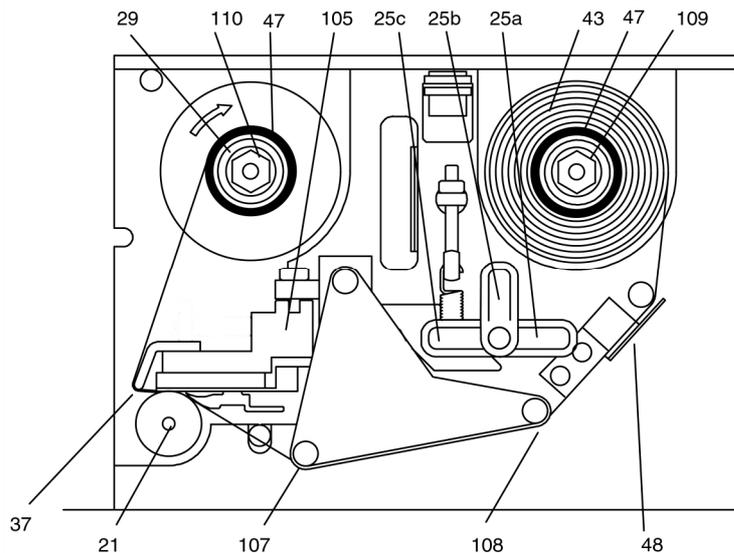
12.5. DRIVE BELT REPLACEMENT

(see picture 28 and 29)

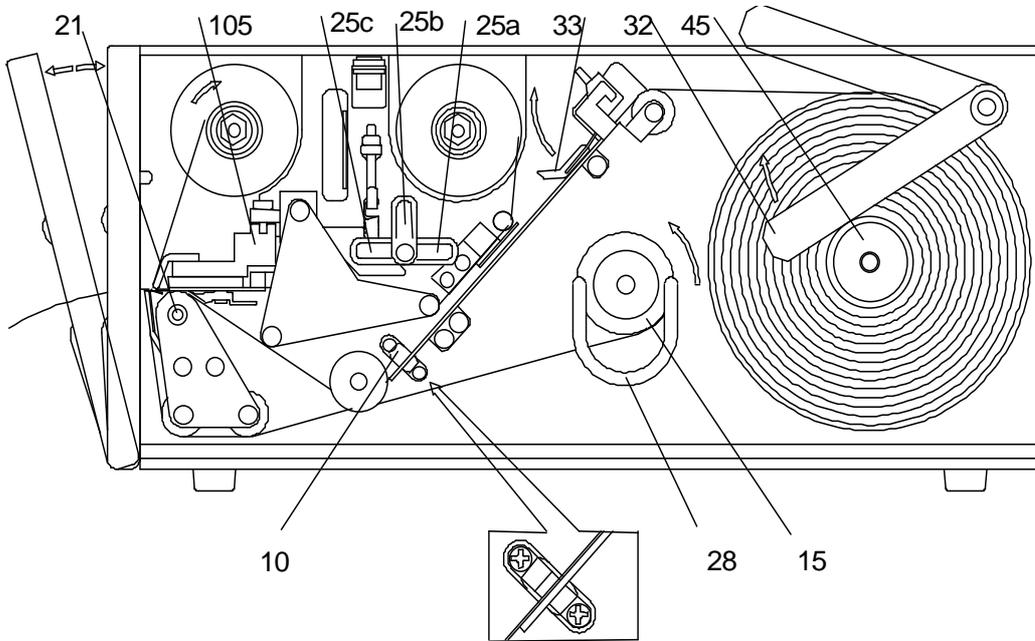
Disassemble the electronic cabinet from the printer chassis as shown in paragraph 14.1, remove the 2 screws #131, 133 and the safeguard plate #134, then

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.

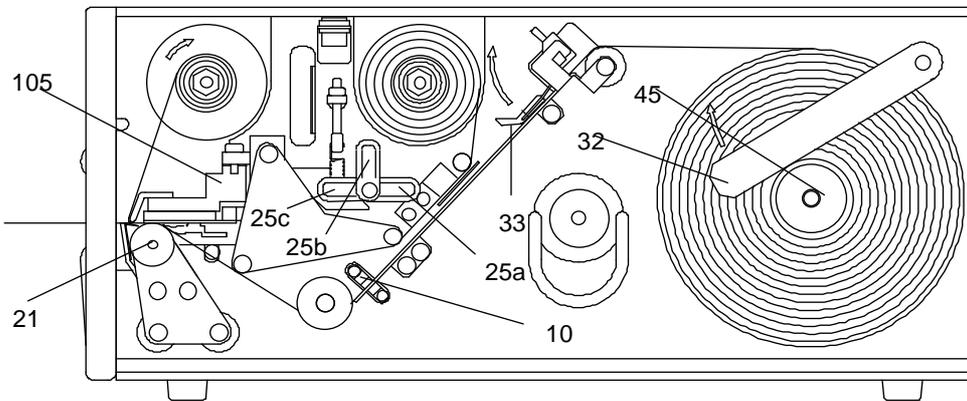
13. PICTURES



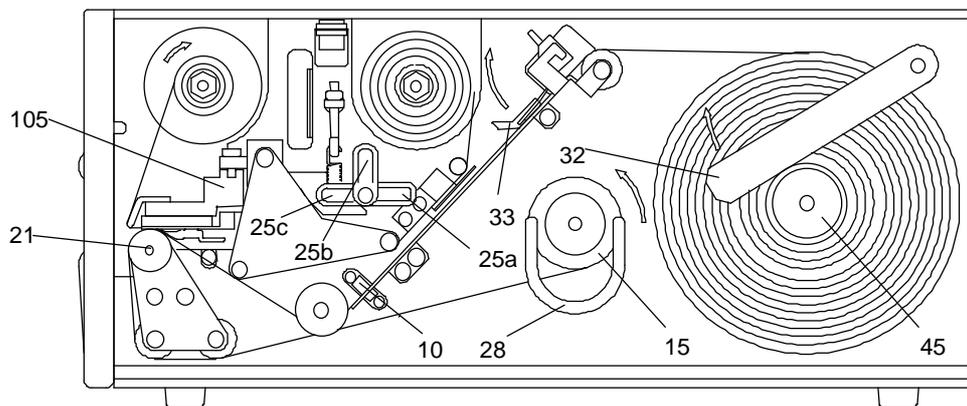
PICTURE 7



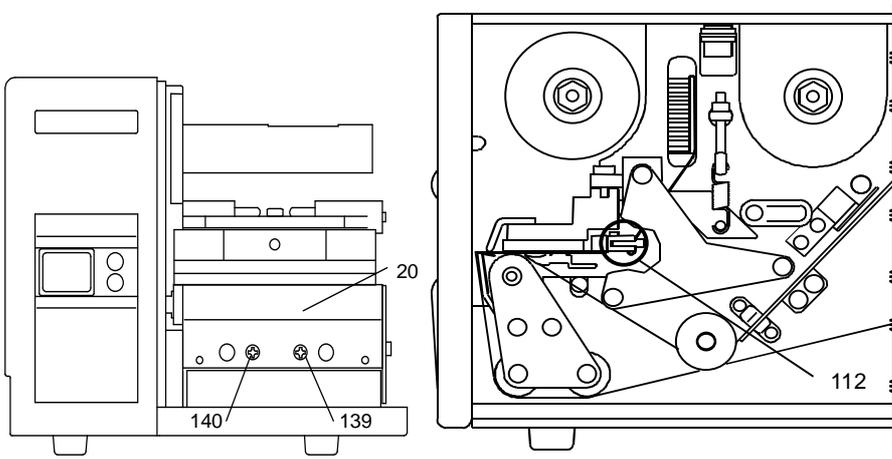
PICTURE 8



PICTURE 9

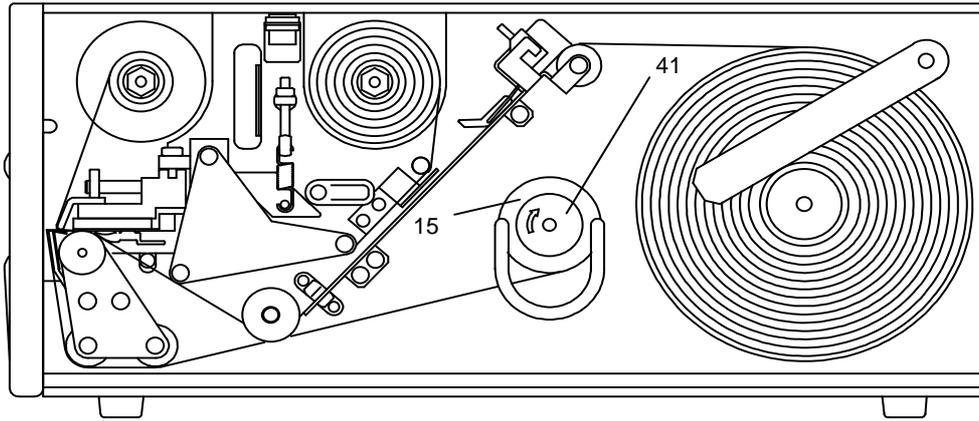


PICTURE 10

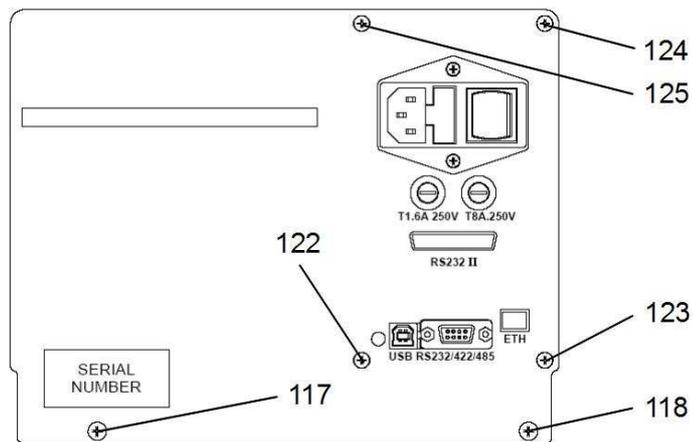


PICTURE 11

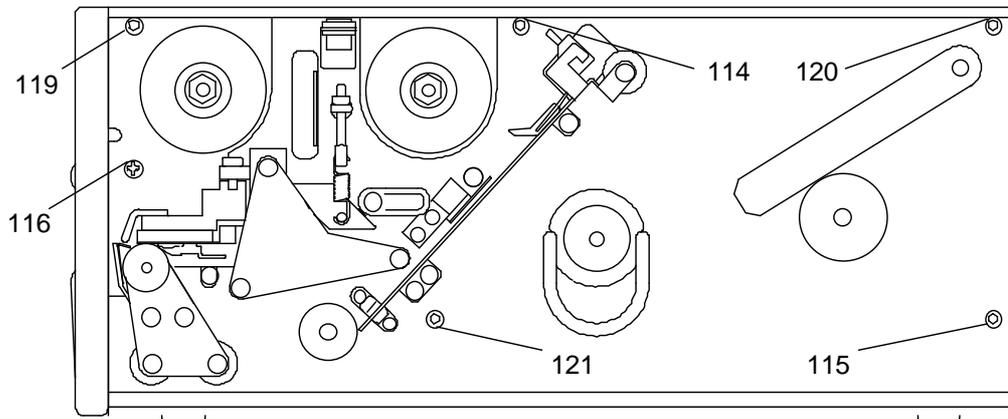
PICTURE 13



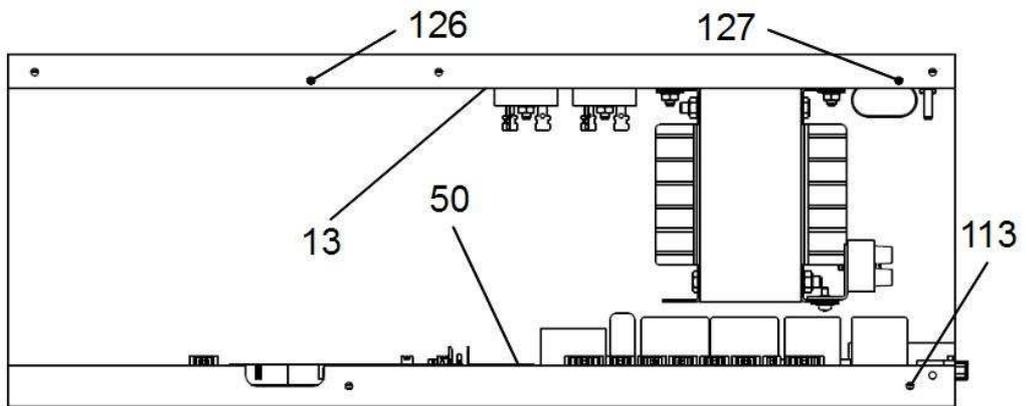
PICTURE 16



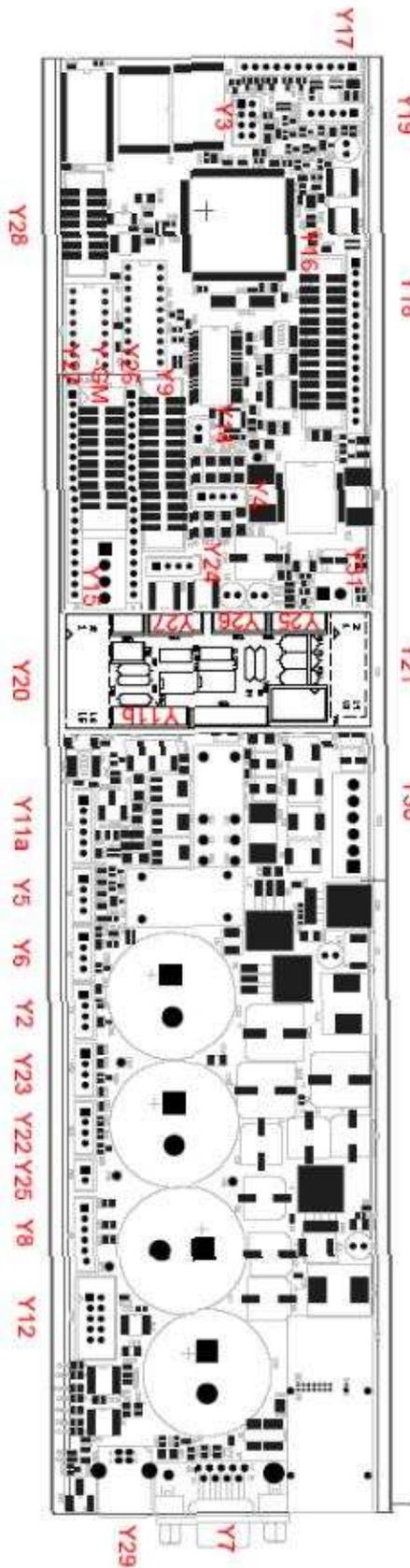
PICTURE 18



PICTURE 19



PICTURE 20

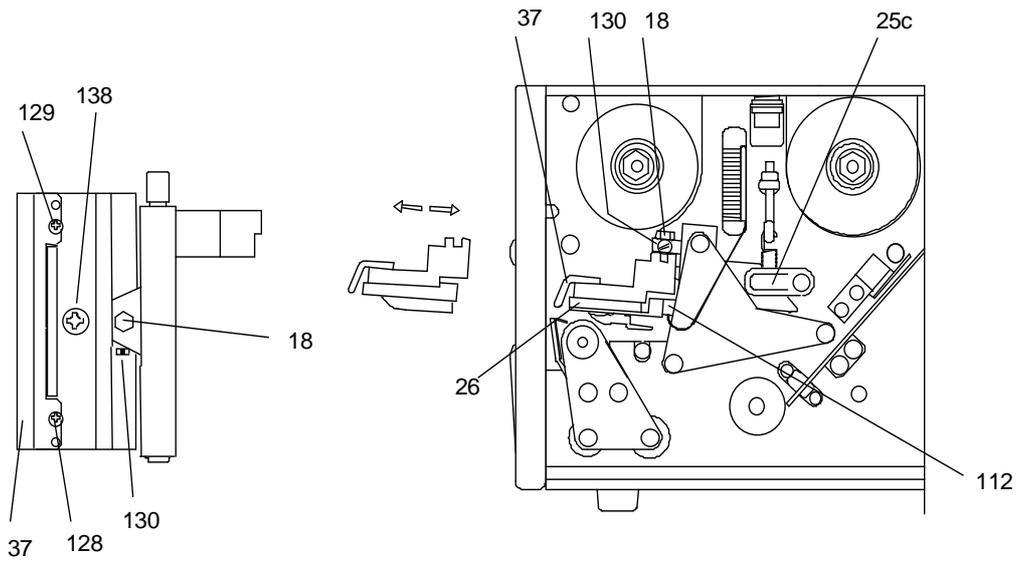


smart 2000/280

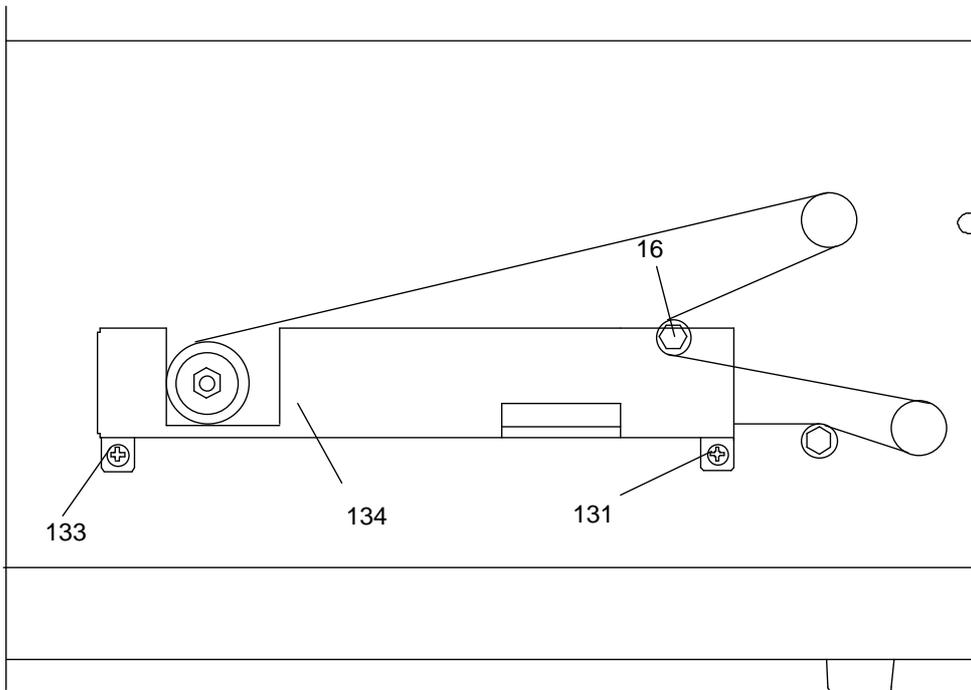
- Y1 Cutter
- Y2 Ribbon sensor
- Y3 Push button, Leds
- Y4 Motor
- Y5 Label sensor
- Y6 Label taken sensor
- Y7 Serial port
- Y8
- Y9 Thermal head 8 dots
- Y10
- Y11
- Y12
- Y13
- Y14
- Y15
- Y16
- Y17
- Y18
- Y19
- Y20
- Y21
- Y22
- Y23
- Y24
- Y25
- Y26
- Y27
- Y28
- Y29
- Y30 Power supply

PICTURE 21

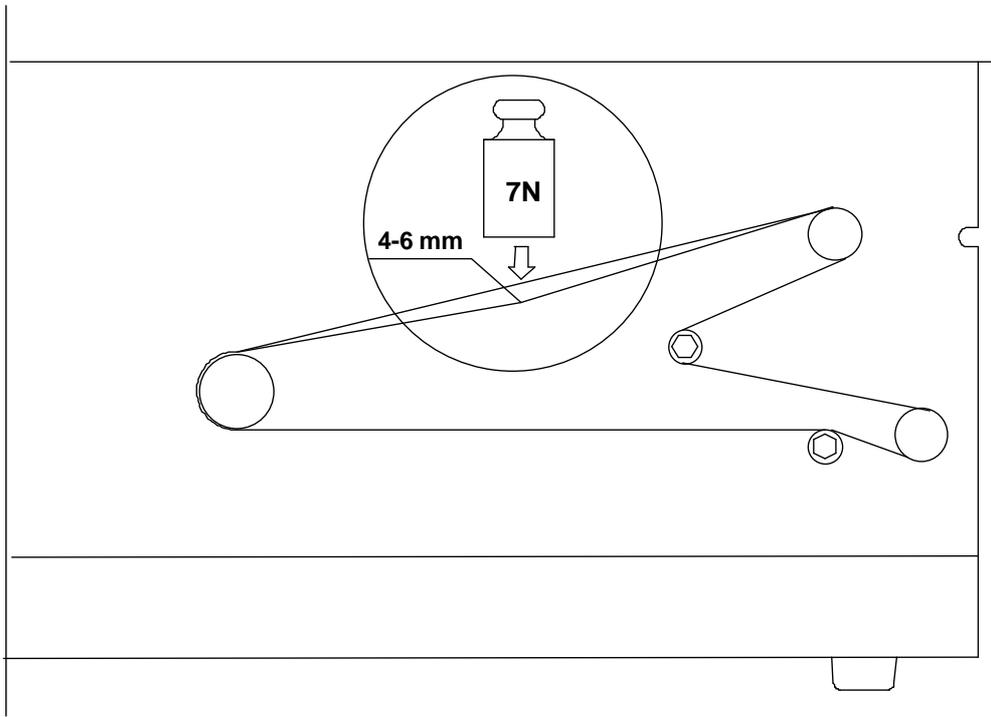
CPU BOARD - layout



PICTURE 27

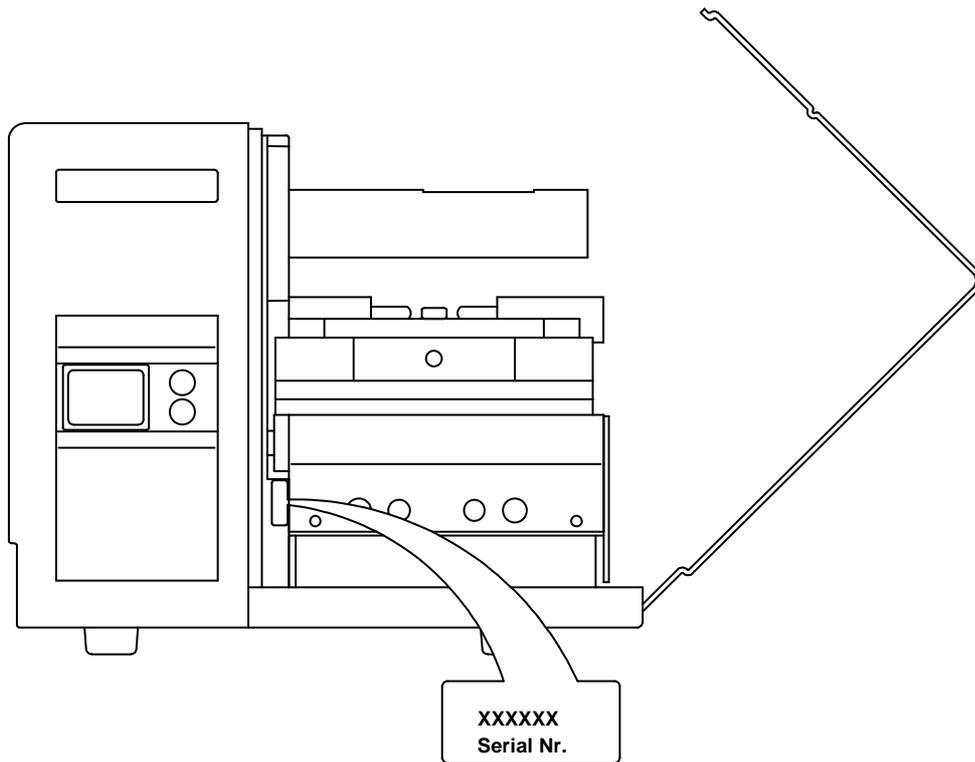


PICTURE 28



PICTURE 29

14. PART LIST AND RELEVANT PICTURES



Spare parts list

(items are referred to following pictures)

| ITEM | CODE | DESCRIPTION | smart 2000/280 |
|------|-------------|----------------------------------|---------------------------|
| | | | |
| 3 | 800944110 | 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 | flat cable | * |
| 13 | 800944080 | power board | * |
| | | | |
| 16 | 800925310 | belt idler assembly | * |
| | | | |
| 18 | 800722460 | nut | * |
| 19 | 061702070 | bush | * |
| 20 | 800926290 | peeling plate assembly | * |
| 21 | 801842380 | feeding roller | * |
| | | | |
| 23 | 800742100 | spring | * |
| 24 | 801872020 | pinion | * |
| 25 | 800925890 | print head lever | * |
| 26 | 800822011 | thermal print head (8 dots) | * |
| | | | |
| 28 | 800762350 | clip holder 4" | * |
| 29 | 800942690 | ribbon rewinding assembly | * |
| 30 | 800942700 | ribbon stock assembly | * |
| 31 | 801845083 | side cover | * |
| | | | |
| 33 | 810940029 | media position holder assembly | * |
| | | | |
| 35 | 80076212401 | grey-green front cover | * |
| 36 | 801842083 | electronic cabinet | * |
| 37 | 800542410 | ribbon plate | * |
| 38 | 800782320 | belt | * |
| 39 | 801622160 | ribbon rewinding gear | * |
| | | | |
| | | | |
| 44 | 800925320 | grey-green front cover (movable) | * |
| | | | |
| | | | |
| 48 | 801625030 | ribbon photosensor | * |
| 49 | 800946610 | stepping motor assembly | * |
| 50 | 800877000B6 | CPU board | * |
| 51 | 800926320 | heat dissipater assembly | * |
| 52 | 801842501 | tie rod | * |
| | | | |
| 55 | 800925280 | ring clip | * |

