O.E.M.
THERMAL & THERMAL TRANSFER
LABEL PRINTERS

models

AH 870 MK2 EL5
&
AH 871 MK2 GM

USER MANUAL

italora

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rev. 03.11

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Features and specifications are subject to change without notice

AH 870 MK2 EL5 & AH 871 MK2 GM
GRAPHIC LABEL PRINTERS

1. TECHNICAL SPECIFICATIONS

PRINTING
Method: Direct Thermal and Thermal Transfer
Resolution: 8 dots/mm
Print width: 102 mm
Print speed: up to 170 mm/s (**AH 870**)
up to 250 mm/s (**AH 871 GM**)
X/Y positioning of texts and bar codes
Texts and bar codes printed in four orthogonal directions
Lines, diagonals, 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
- 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 memory, 100 fields each
Up to 10 protection levels for variable data printing
4 up/down alphanumeric counters, 16 digits
Real Time Clock
Black intensity adjustable via SW
Print button for last label repeating
INTERFACING SIGNALS
Three optoisolated I/O
DATA TRANSFER INTERFACE
Serial RS232, serial parameters settable via software
RS485 : on request
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
4 MB flash memory
1 MB RAM
PCMCIA memory interface
DETECTORS
End of paper and feeding synchronism
End of thermal ribbon
PRINT MEDIA
Die cut labels
LABEL SIZES
Width: 30 mm min., 110 mm max
Length: 10 mm min.
1.200 mm max
Key: width min.: 2 mm
depth min.: 25 mm starting from the inner edge
ROLL SIZES
Width: 30 mm min., 110 mm max
Outer diameter: 220 mm max
Core diameter: 45 mm min.
THERMAL RIBBON
Base polyester film, outside coated
Outer diameter: length 600 meters max
Width: 35 mm min., 110 mm max
Core diameter: 25.4 mm
PRINTER DIMENSIONS
Height: 175 mm; Depth: 452 mm
Length: 261 mm; Weight: 20 Kg
POWER REQUIREMENTS
Voltage: 115/230/240 Vac; 50-60 Hz
ENVIRONMENT
Operating temperature: 0°/ 40° C
Storage temperature: -20°/60° C
Humidity: 10% - 95% non-condensing
OPTIONS
Label taken sensor
ETIK wysiwyg label editor Windows based

2. UNPACKING
Open the box and check the content :

- **italora** label printer model **AH 870 MK2 EL5** or **AH 871 MK2 GM**
- Electronic Control Unit cabinet
- Connection cables
  serial RS232, DB9, DB25
- 1 DIN connector 6 poles
- unwind holder and flanges
- power cable

- roll of labels
- roll of thermal ribbon
- printing tests
- CD Rom with manuals and Etik Light

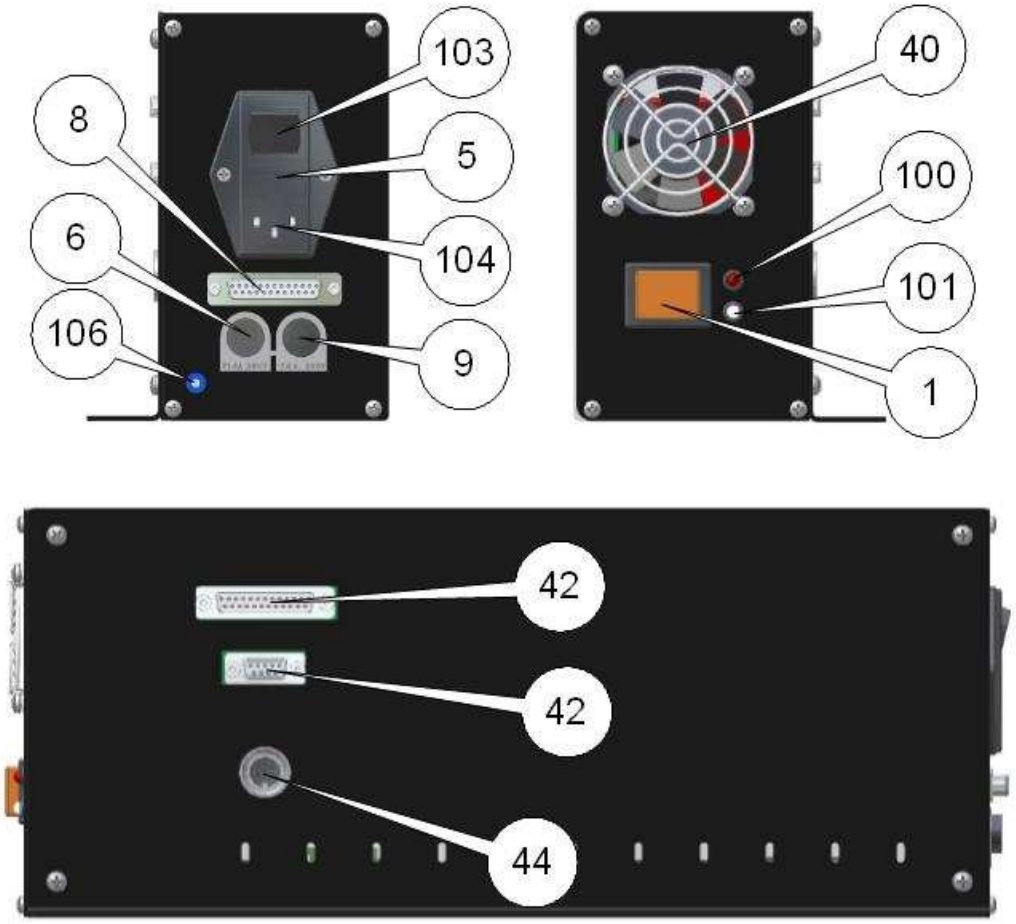
3. GENERAL VIEW

(See picture 1)

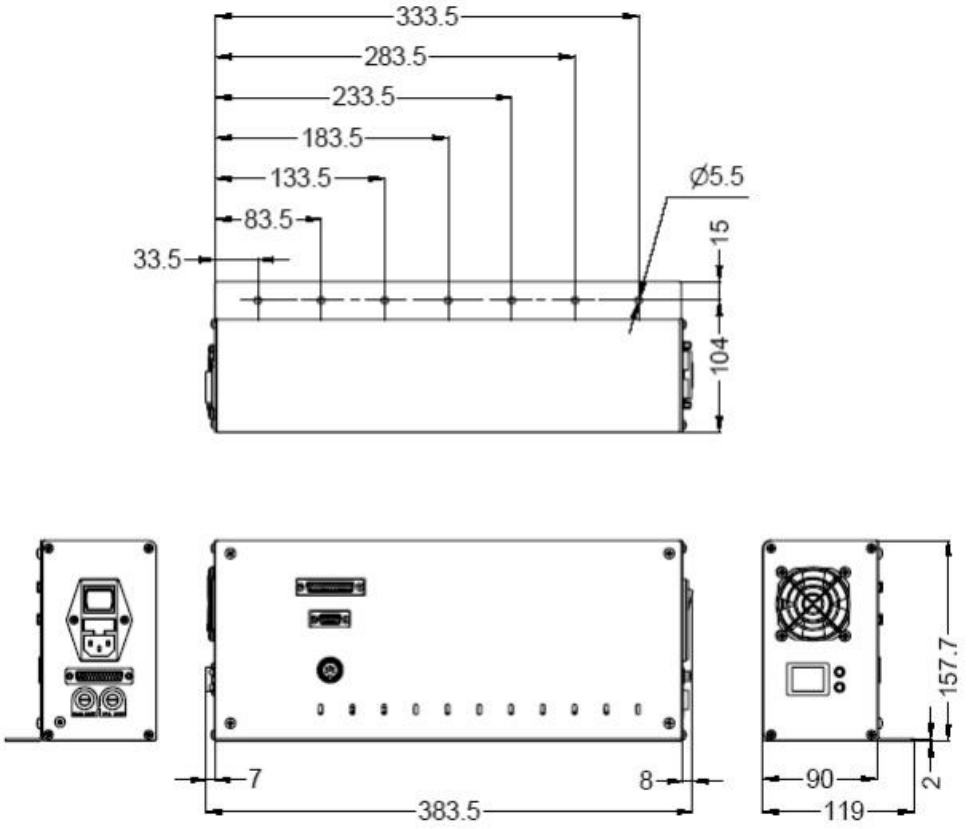
1: manual printing push button
5: 2 fuses 2AT (main)
6: 1 fuse 1.6AT (logic)
8: interfacing connector
9: fuse 8AT (thermal head)
40 fan
42 connection board
44 I/O connector
100: **red led** => lit at POWER ON
101: **status led** =>
- **lit green**: ON-LINE
- **blinking green**: end of paper
- **lit yellow**: syntax error (push printing button to restart)
- **blinking yellow**: head temperature control active
- **alternate green/yellow blinking**: end of ribbon (TT models only)

103: main switch
104: power cord plug
106 trimmer for black intensity fine adjust
- clockwise = more intensity
- anticlockwise = less intensity

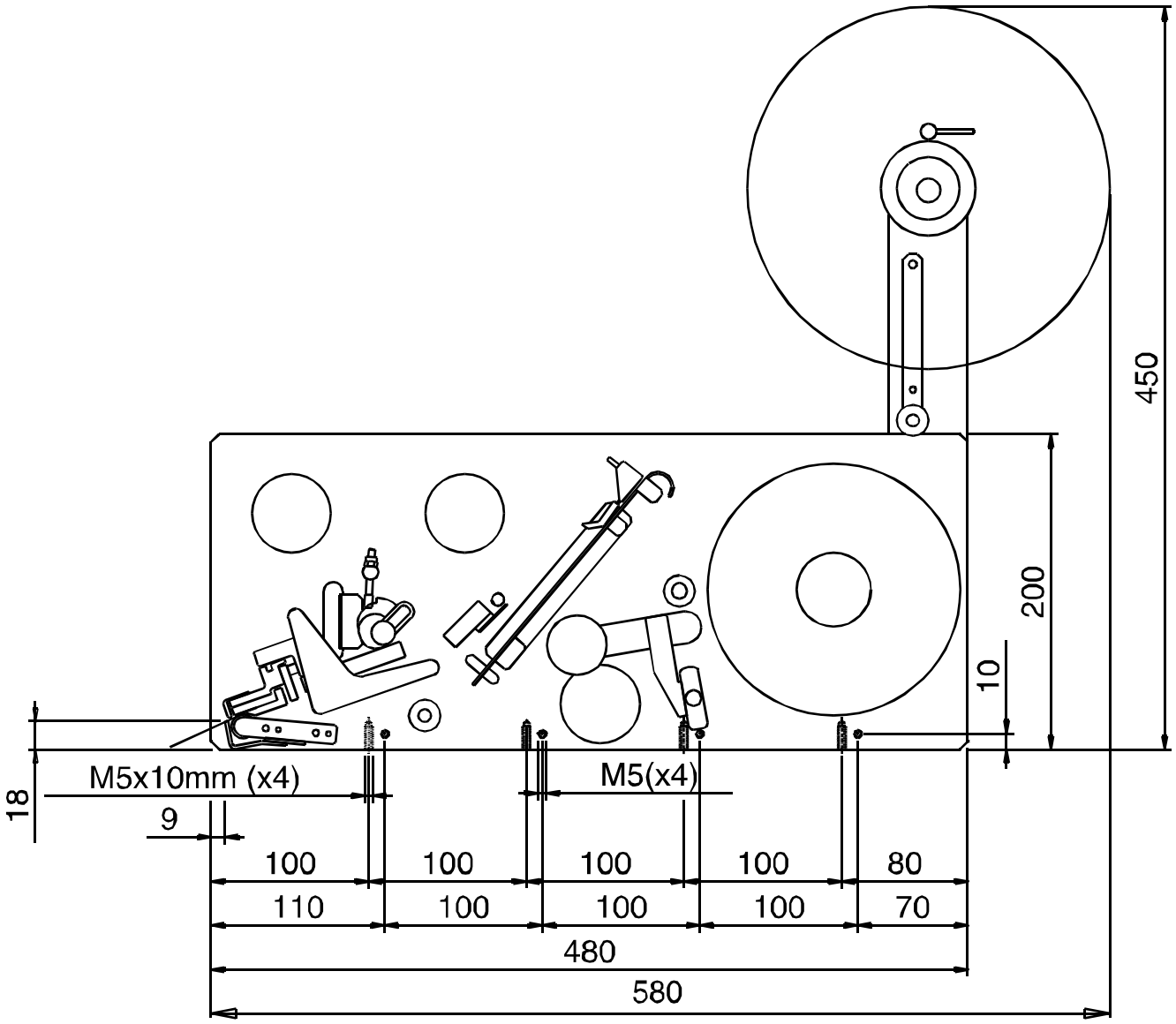
Electronic Control Unit 80.560.00xx - overall dimensions and fitting holes



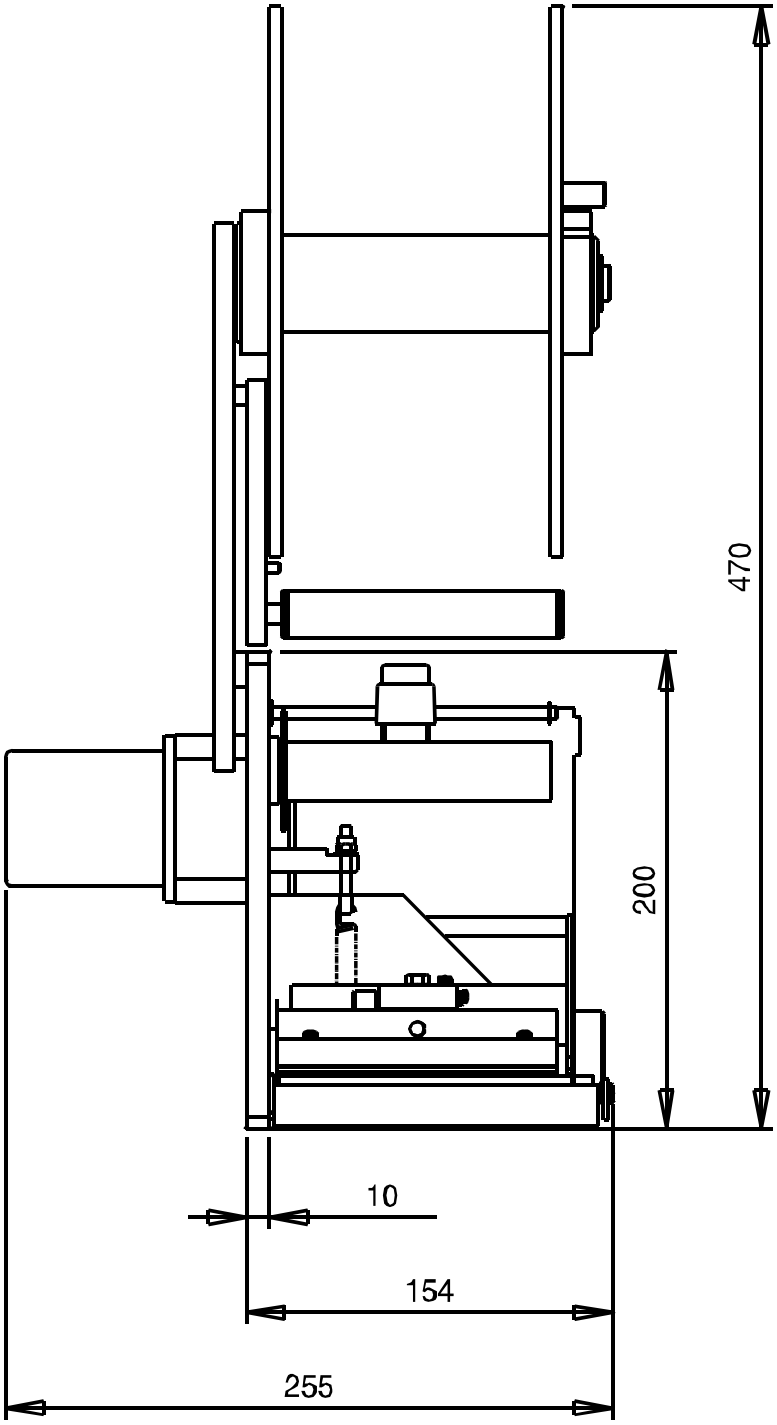
PICTURE 1



Printing mechanism - overall dimensions and fitting holes



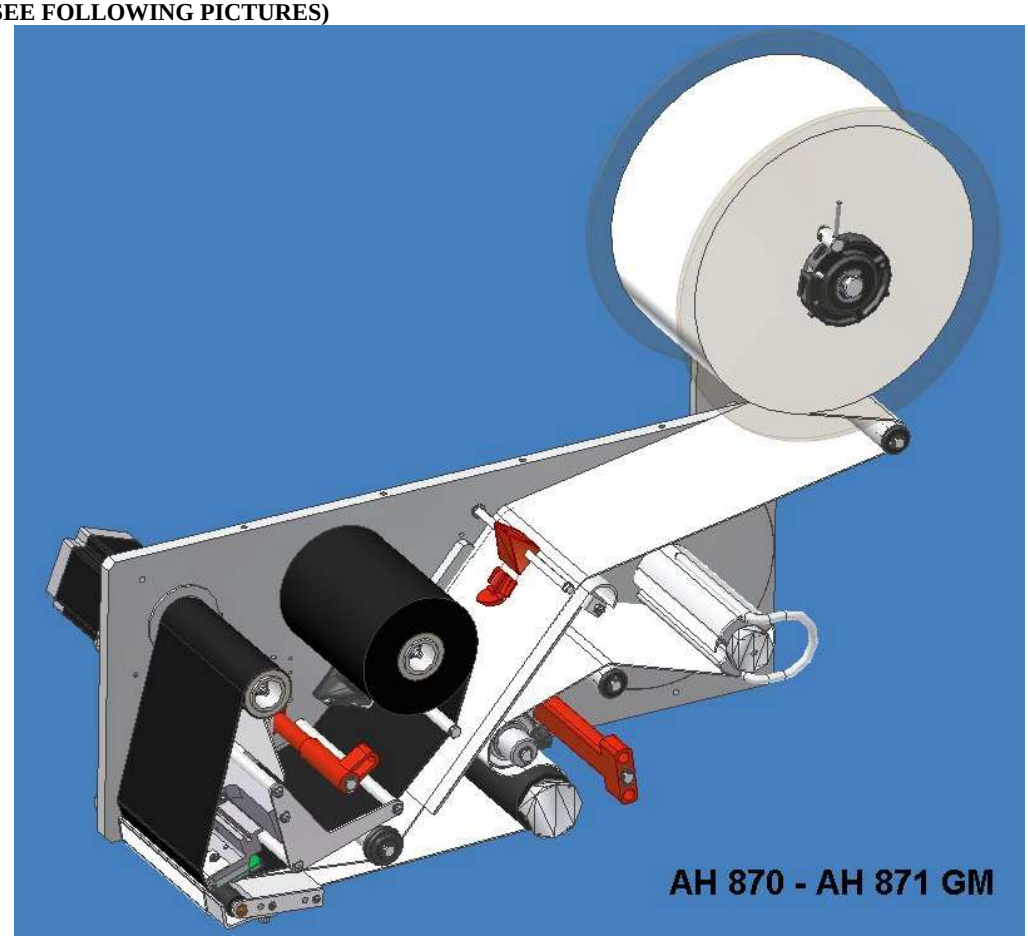
PICTURE 2 (side view)

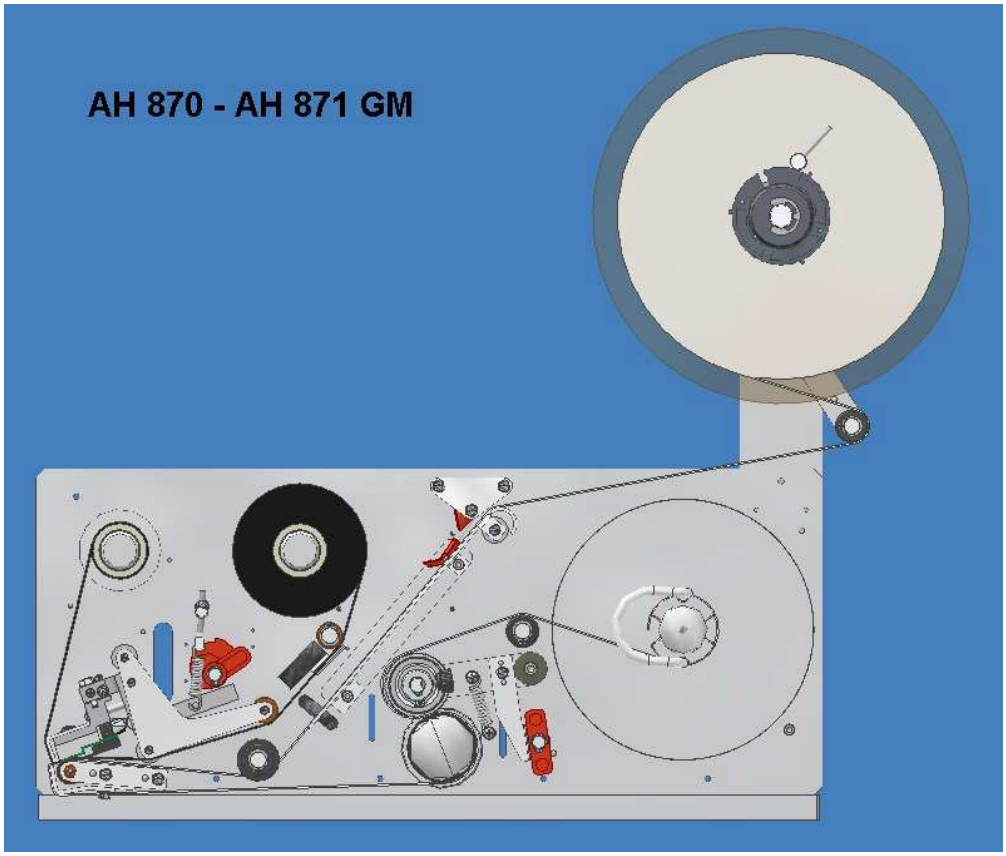


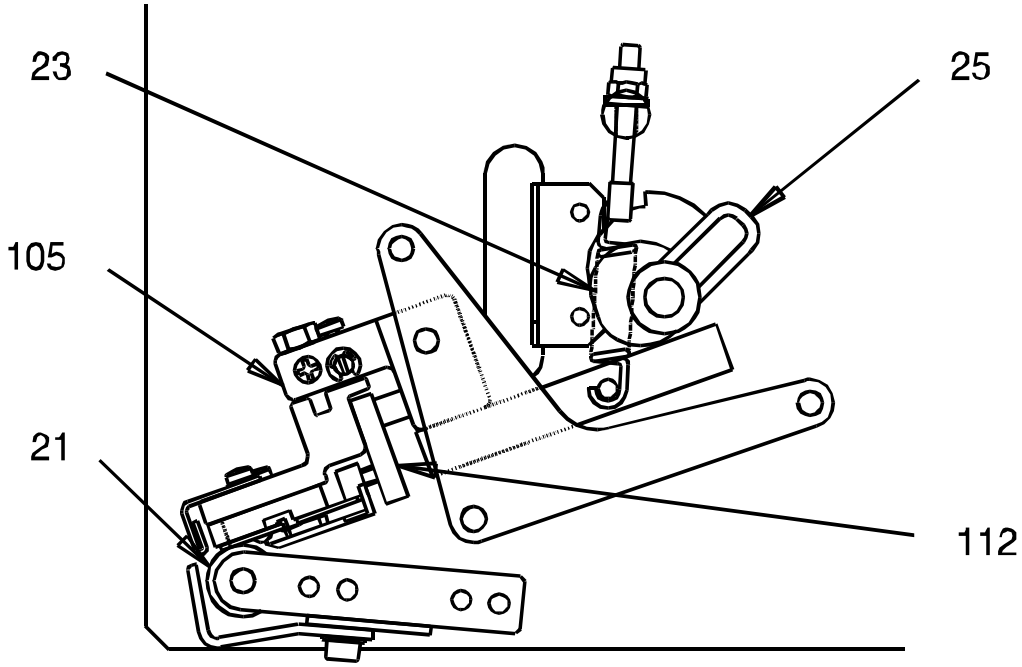
PICTURE 3 (front view)

4. ROLLS COMPARTMENT DESCRIPTION

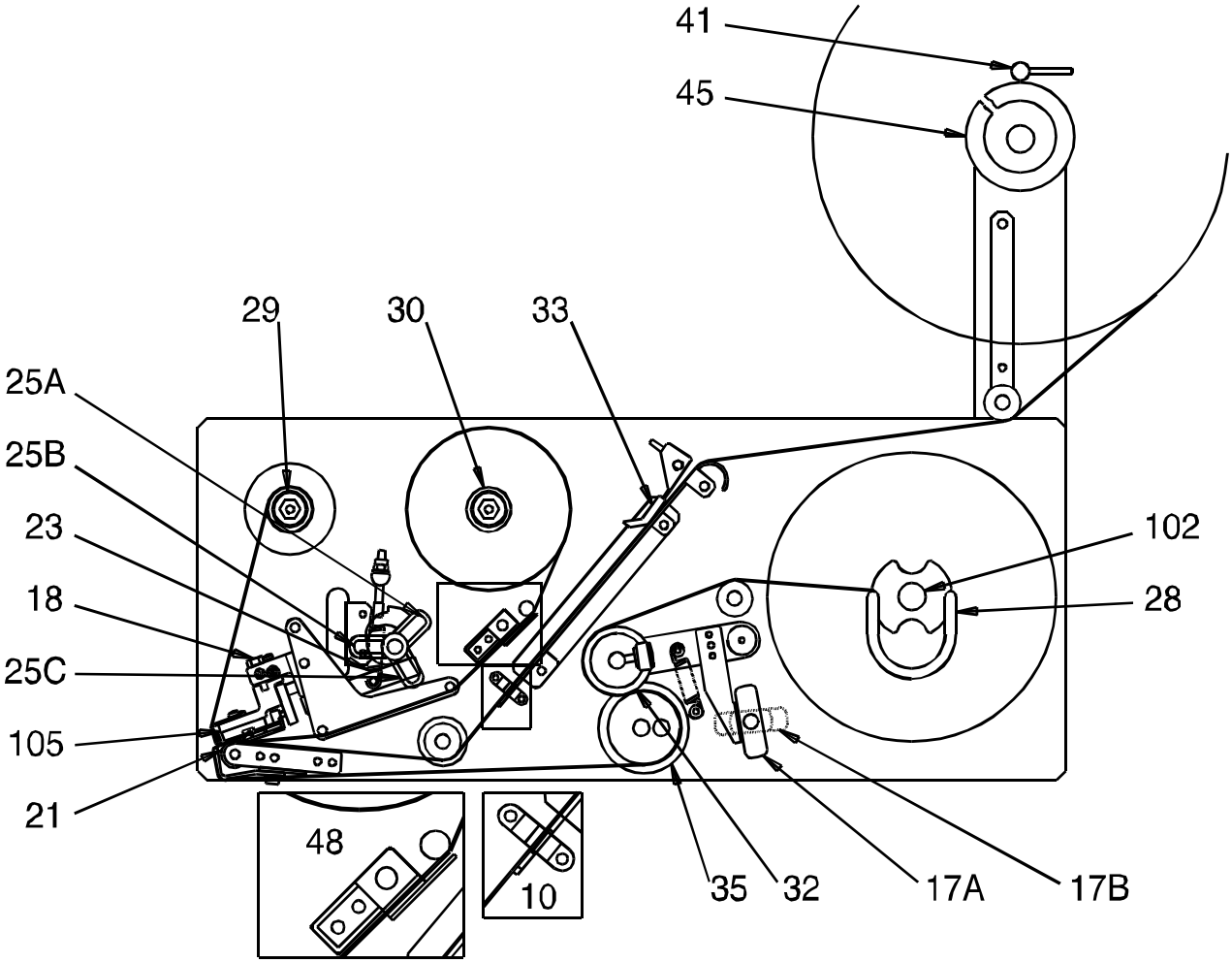
(SEE FOLLOWING PICTURES)







PICTURE 4



PICTURE 5

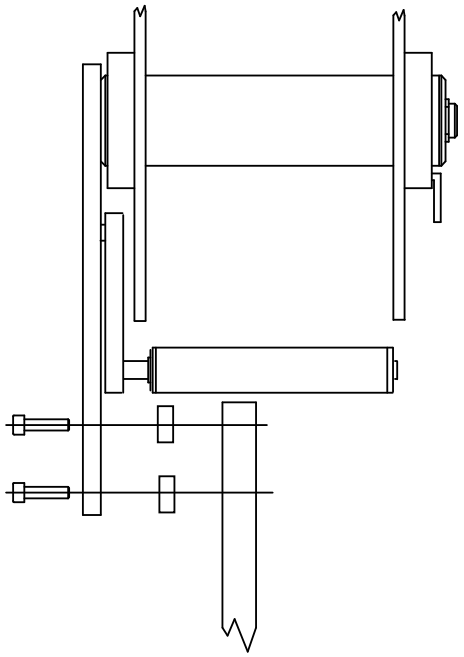
10 - photosensor for end of roll and label synchronisation
17 - lock / unlock toggle lever
17a - working position
17b - open position
18 - print head position fine adjustment
21 - printing roller
23 - print head assembly pressure spring
25 - lock / unlock print head lever
25a - working position

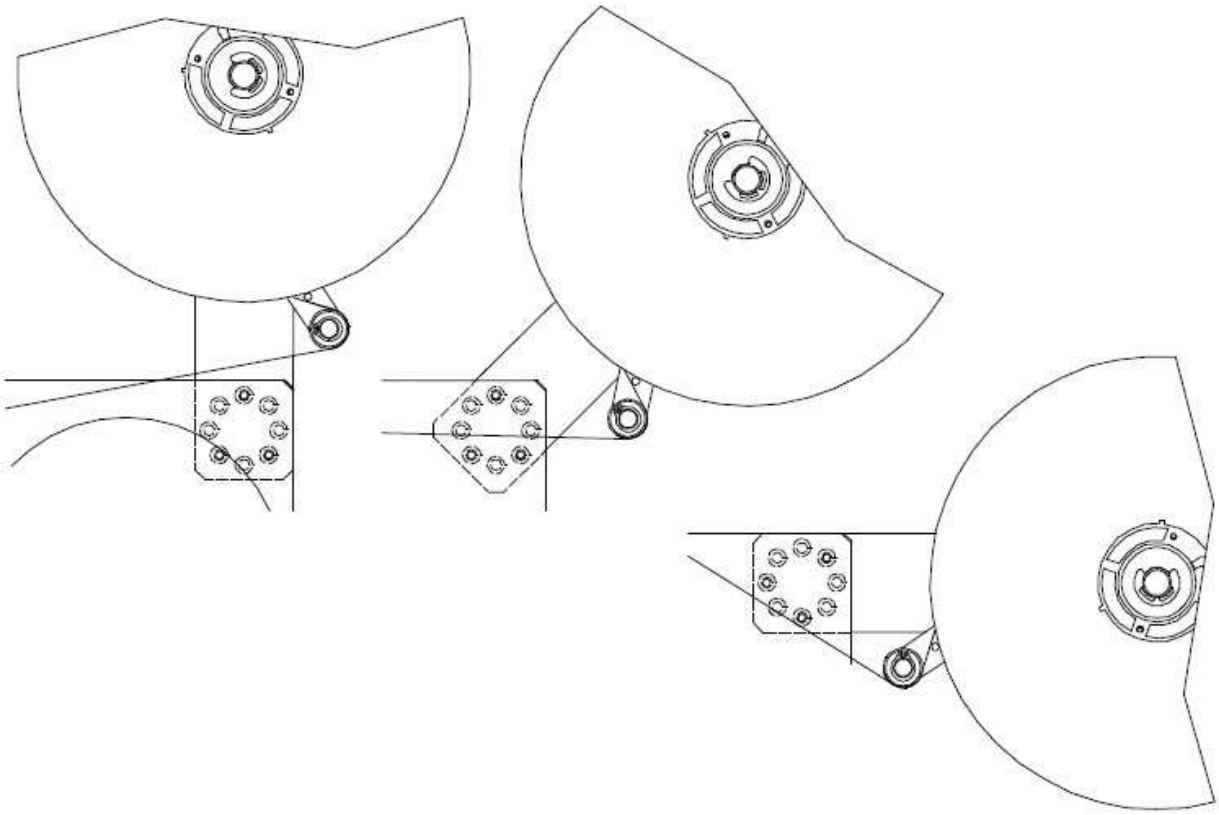
25b - open position
25c - cleaning position
28 - clip holder
29 - thermal ribbon rewinder
30 - thermal ribbon stock
32 - pressure roller
33 - pressure clip
35 - driving roller
41 - lock / unlock flange lever
45 - label unwind holder
48 - photosensor for end of thermal ribbon
102 - rewinding shaft
105 - print head assembly
112 - print head connector

5. INCOMING INSPECTION

* Assemble the label unwind holder support and flanges as shown in picture 6, using provided five screws and spacers.
* Proceed with label and ribbon loading, see chapter 7.
* Connect the Printer Mechanism to the Electronic Control Unit using the two provided cables.
* Check the correct pinout of the serial Cannon 25 pins female connector and connect the printer to the computer .
* For further details see chapter 8 "Interfacing".
* Check the voltage on the name plate next to the power receptacle.
* Connect the power cable to a grounded power line
* 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 baking paper transparency in permanent memory. In case of change of print media see the following paragraph.**





PICTURE 6

5.1. LABEL FORMAT SET UP PROCEDURE

(SEE PICTURES 4 and 5)

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 printing roller and the printing head #21,105.
4 - Lift the pressure roller up by rotating lever #17b.
5 - Thread the web between the driving roller and the pressure roller #35,32 up to the rewinding shaft #15.
6 - Check web has been rightly positioned under the label photosensor #10.
7 - Lift the printing head and the pressure roller down by rotating levers #25a and #17a.
8 - Switch the printer on while pushing the print button.
9 - Printer ejects some labels (depending on their length) and stores the values of the media.
10 - Release the print button.
11 - The green led lit and the printer is ready to work.

6. PRINTING MEDIA DESCRIPTION

6.1. 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%

SUGGESTED MODELS
- Fasson Fasthermal NT
- Kanzaki KPT 86-H
- Fasson Fastransfer MP - S470 (TT models)
- Fasson Fastransfer Extra - S470 (TT models)

LABEL DIMENSIONS
See Chapter 2

6.2. THERMAL RIBBON SPECIFICATIONS

- film thickness 4.5 ÷ 6 micron
- core diameter: 25.4 mm
- width: 35 mm min/ 110 mm max
- length: about 600 meters
- 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.

7. THERMAL RIBBON AND LABEL ROLL REPLACEMENT

7.1. THERMAL RIBBON REPLACEMENT

(SEE PICTURE 7)

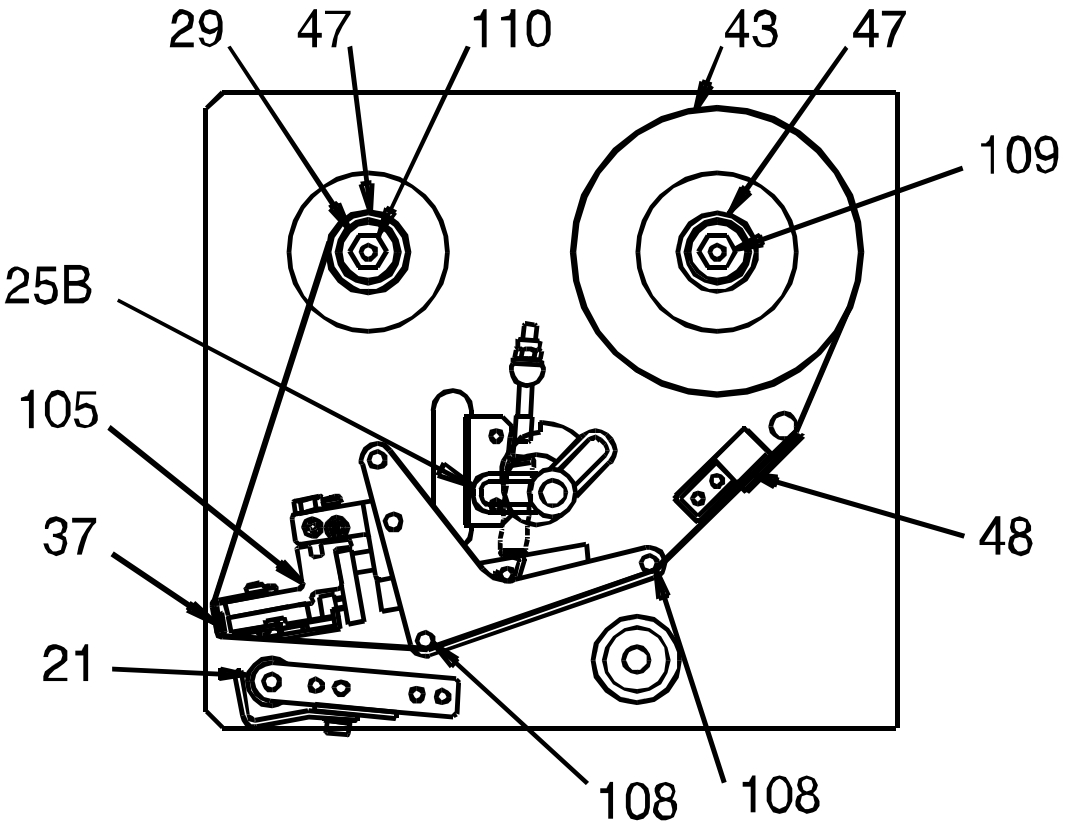
Remove the used roll. Remove the core #47 from the shaft and put it on the rewinder #29.

By rotating the lever #25b, lift the printing head #105 from the printing 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 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 (or #25c).



PICTURE 7

7.2. LABEL ROLL REPLACEMENT

(SEE PICTURE 5)

In case of changing of label format or printing media type, remember to follow the "Label format set up procedure" shown on paragraph 5.1.

Remove the movable flange by rotating the lever #41.

Remove the empty label roll.

Insert new label roll onto roller #45

Reassemble the movable flange and push it tightly against the side of the label roll; lock lever #41. labels and ribbon free.

By rotating the lever #17b, lift the pressure roller #32 from the driving roller #35.

Remove clip #28 from the rewinding shaft #102.

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, thread the web between the printing roller and the thermal head #21,105, then around the driving roller and under the pressure roller #35,32, finally slide the liner on the rewinder unit #102 and fasten it with the clip holder #28.

Turn the rewinder to stretch the paper.

Turn head lever and toggle lever back to closed positions #25a,17a.

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

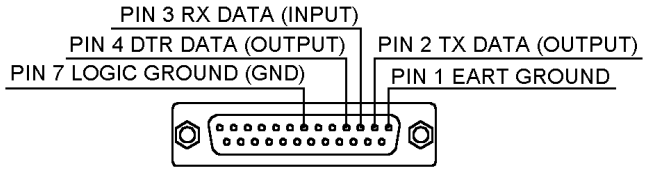
Check pressure clip #33 has been positioned between centre and outer side of the label.

WARNING: Italora OEM printer mechanisms must operate only in peel-off mode with backing paper rewound by toggle lever rollers. Any other print mode (strip form, tear-off, etc.) is not allowable and cause an incorrect paper feeding and bad printout quality.

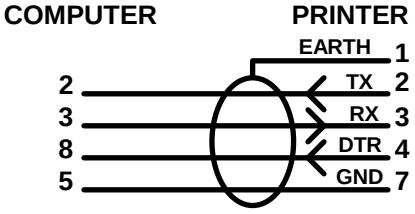
8. INTERFACING

8.1. SERIAL INTERFACE

Electronic Control Units 80.560.00xx for **AH 870** and **AH 871 GM** printer mechanisms have a RS232 hardware interface (RS485 on request). Provided on board connector is a Cannon 25 pins "DB" female cabled as shown in the following pictures.

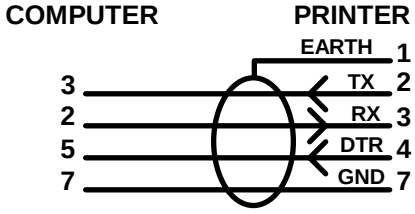


COMPUTER CONNECTOR WITH 9 PINS



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

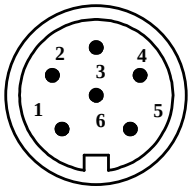
COMPUTER CONNECTOR WITH 25 PIN



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

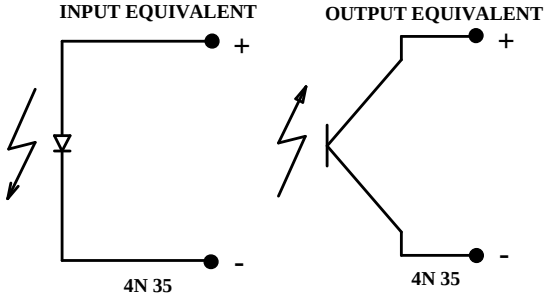
8.2. I/O SIGNALS

Electronic Control Units 80.560.00xx are provided of three optoisolated lines for I/O signals: one input and two outputs. A six pins DIN connector type GPE/DIN 40040 is present cabled as follows.



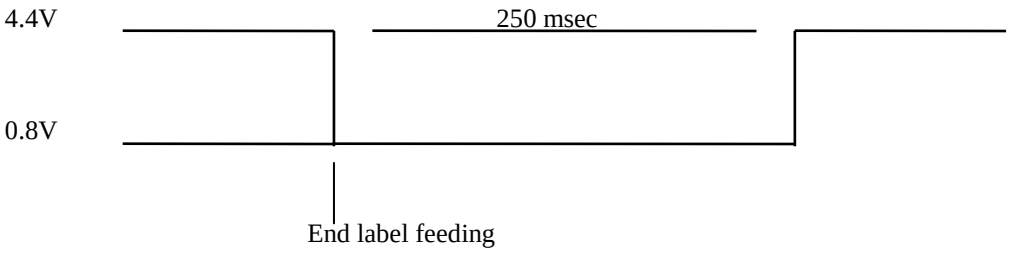
(FRONT EXTERNAL VIEW)

1) + START PRINT (INPUT)
2) - START PRINT (INPUT)
3) + ALLARM (OUTPUT)
4) - ALLARM (OUTPUT)
5) + PRINT END (OUTPUT)
6) - PRINT END (OUTPUT)



PRINT END output signal is a 250 milliseconds active pulse (optotransistor in conduction) when printer has finished to eject a printed label. This signal is commonly used to get one of ours printers interfaced with automatic systems, such as applyers. It can be programmed in two different ways with the "?66&" software command (see"**PROGRAMMING MANUAL**"):

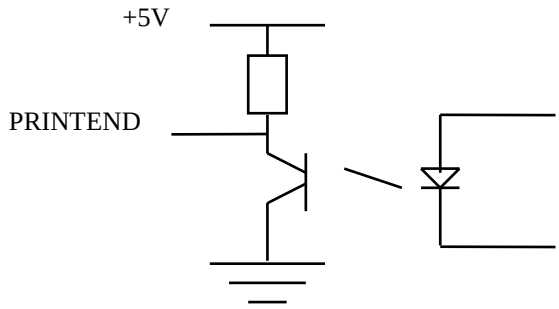
* "*?66&0*" standard behaviour: a pulse of 250 msec is driven as soon as the feeding of a label has been completed. In these 250 msec (optotransistor in conduction state) the signal goes from the high level (4.4V) to the low level (0.8 V).



In this case the delay between a label and its next is, obviously, at least 250 msec.

* "*?66&1*": the pulse is driven (optotransistor in conduction state) during the whole label feeding so, in this period, the signal goes low.

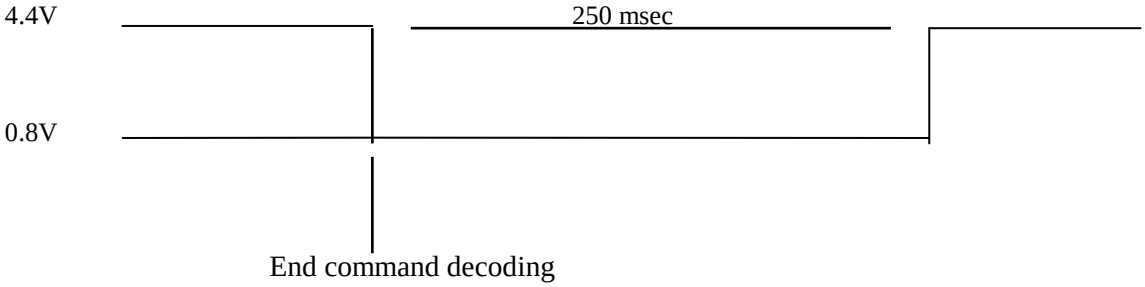
The electronic circuit is like this:



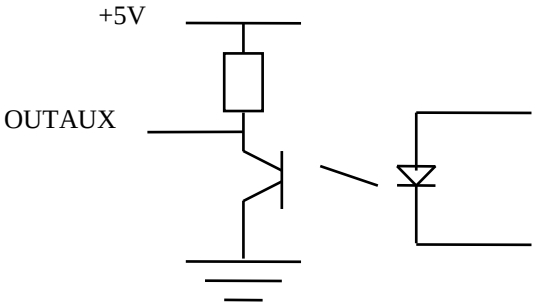
ALARM output (OUTAUX) signal is a level output becoming active (optotransistor in conduction) when printer detects an alarm condition: it remains active until alarm condition is present.
In end of paper or end of ribbon condition, together with the traditional led blinking, this auxiliary signal goes low and it stays there until you put the printer well again.

With your software you can program this signal in two different ways (see "**PROGRAMMING MANUAL"**):

* *disabled signal* (default): the signal level is always high (4.4 V).
* *enabled signal*: you can choose this possibility with the "?64&" software command; the signal goes low for the next 250 msec after the command decoding.



The electronic circuit is like this:



START PRINT input signal is activated by Set Up menu. For more information see "**PROGRAMMING MANUAL**".

Meaning of START PRINT input is "print enable": printer will not print any label, as after an Host computer command or as after a Print Button pushing, until START PRINT is active for at least 50 milliseconds. For every ejected label a 50 milliseconds minimum active pulse is required. Otherwise, after a pulse on this input, the printer will print only if a previous print or batch command was received, or a Print Button pushing was executed.

9. MAINTENANCE

WHEN NOT IN USE:

- SWITCH OFF POWER
- ALWAYS LIFT UP THE PRINTHEAD AND THE TOGGLE LEVER MECHANISM

9.1. CLEANING

Print Head

- Turn the power off.
- Wait until thermal head cools down.
- Lift the print head by using the lever
- Remove labels and thermal ribbon.
- Moisten a cotton bud with isopropyl alcohol.
- Place it between thermal head and roller and move it gently from side to side.
- Repeat until clean.
- Slowly pull out cotton bud
- 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.

10. TROUBLE SHOOTING

10.1. NO LABELS FEEDING

Four situations may occur.

a) RED led is OFF, check (pict.1,#100):
- main voltage
- main switch (pict.1,#103) ON.
- main connector (pict.1,#104) plugged in
- main fuses (pict.1,#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.5,#10)

c) RED led is ON, STATUS led is BLINKING alternately GREEN and YELLOW, check:
- thermal ribbon is not used up.
- thermal ribbon position under the photosensor (pict.5,#48).

d) RED led is ON, STATUS led is BLINKING YELLOW:
- head temperature control active, printer stops until temperature has fallen to normal values.

10.2. INCORRECT LABEL ALIGNMENT

Make sure that:
- print head is closed (pict.5,#25a)
- toggle lever is closed (pict.5,#17a)
- paper position under the photosensor (pict.5,#10)
- backing paper is correctly rewound (pict.5,#102)
- pressure clip (pict.5,#33) is positioned between centre and outer side of the label.
- movable flange is tightly pushed against the side of the label roll with the lever (pic.5,#41) in lock position.

See also "Label format set up procedure" paragraph 5.1

10.3. PAPER SLIDES TO RIGHT SIDE

Check whether:
- pressure clip (pict.5,#33) is positioned between centre and outer side of the label.
- movable flange is closely positioned against the side of the label roll with the lever (pic.5,#41) in lock position.

10.4. PRINTING WITH PATCHES MISSING

Check whether:
- thermal print head needs cleaning (chapter 9)
- 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.

10.5. BLANK LABELS

Check whether
- the fuse (8AT) on the back panel has blown
- the print head connector is correctly plugged in (pict.4,#112) with polarity key up.
- thermal ribbon is correctly positioned, opaque surface on the label side.

10.6. POOR PRINTING CONTRAST

- See Electronic Control Unit rear panel.
- turn the print head screw (pict.1,#106) for temperature fine adjustment : clockwise to make print darker. anticlockwise to make print lighter.

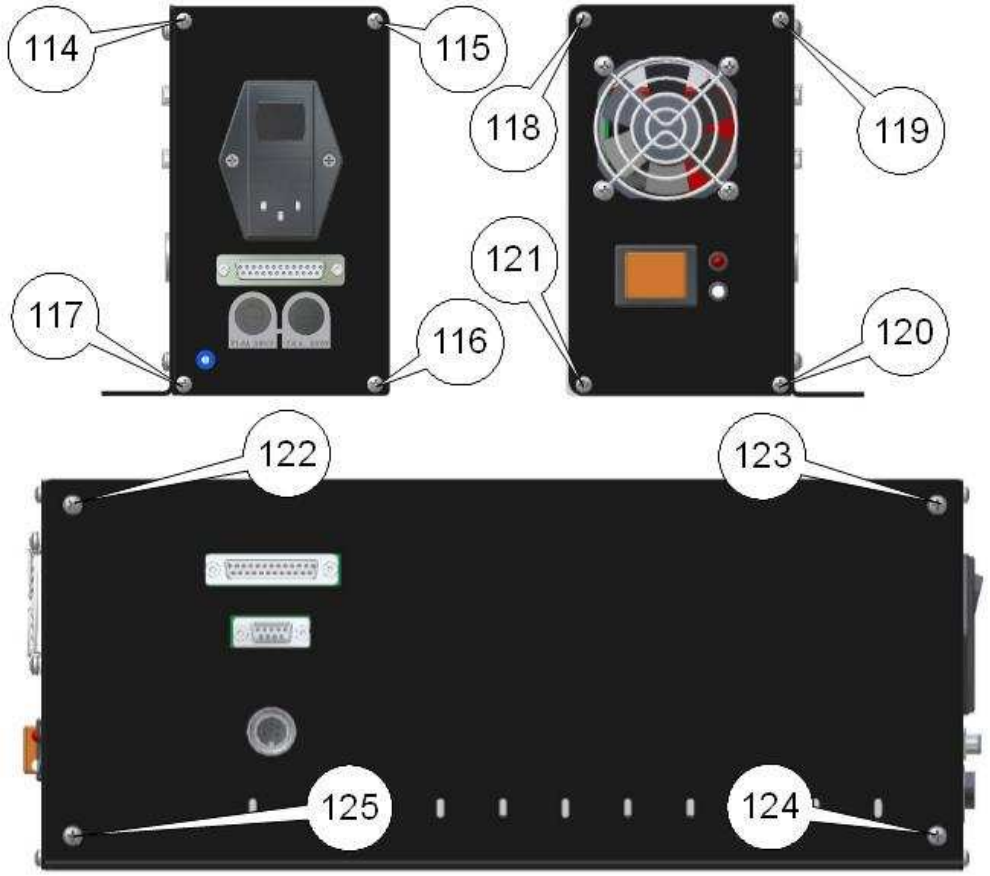
Otherwise use the softare command ?77& (see Programming Manual)

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

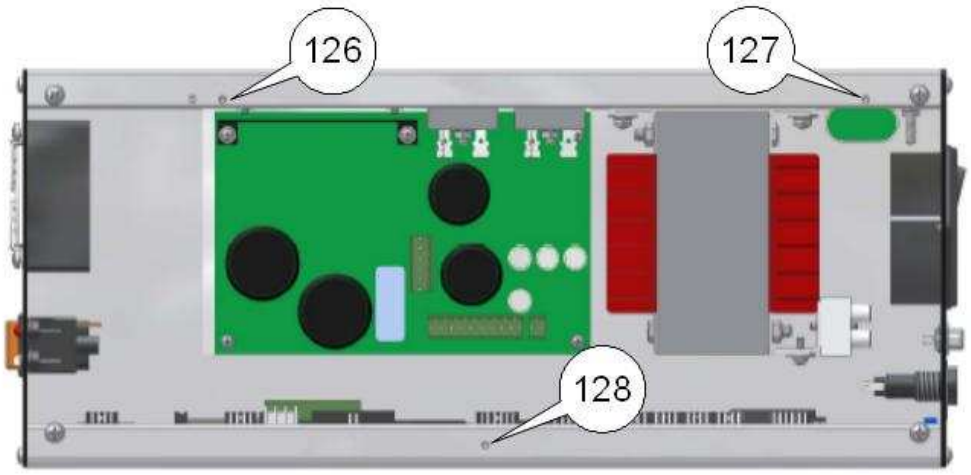
11. HARDWARE NOTES

11.1. HOW TO CHECK ELECTRONIC BOARDS

- **First unplug the power cable from the electronic cabinet.**
- turn the 4 front and the 4 rear screws out (pict.8a#114 - 121).
- remove front and rear panels.
- turn the 4 side screws out (pict.8a,#122 - 125).
- turn the 3 inner screws out (pict.8b,#126 - 128).
- Unplug the following connectors from CPU board (pict.21 and 21 bis).and pull carefully off the electronic boards from the chassis
  - Y2 = ribbon photosensor
  - Y3 = leds and push button
  - Y4 = stepping motor
  - Y5 = label photosensor
  - Y7 = serial interface
  - Y9 = thermal head (**AH 870**)
  - Y10 = power supply
  - Y14 = fan
  - Y15 e YGM = thermal head (**AH 871 GM**)
- disconnect the ground cable turning the chassis nut out
- unplug the fuses connectors and the main switch connector.



PICTURE 8a



PICTURE 8b

11.2. PRINT HEAD PROTECTION FUSE REPLACEMENT

- Thermal print head is protected by an 8 A timed fuse (pict.1,#9).

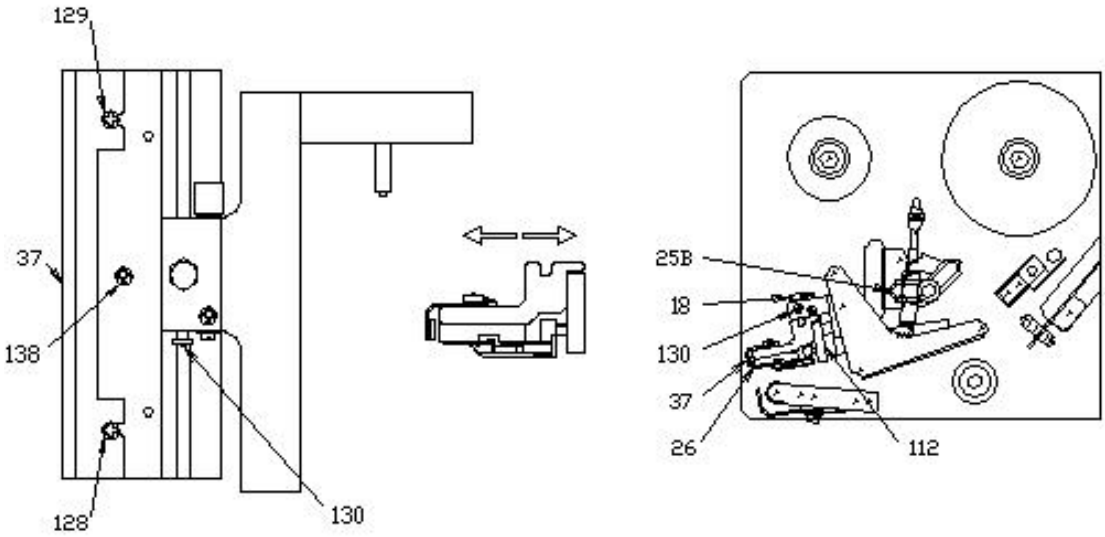
11.3. THERMAL PRINT HEAD REPLACEMENT

(SEE PICTURE 9)

1 switch the printer off .
2 unplug 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.
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 thermal head connector(s), wrong connection causes irreversible damage to the print head functionality (pict. 4)

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 (TT models).

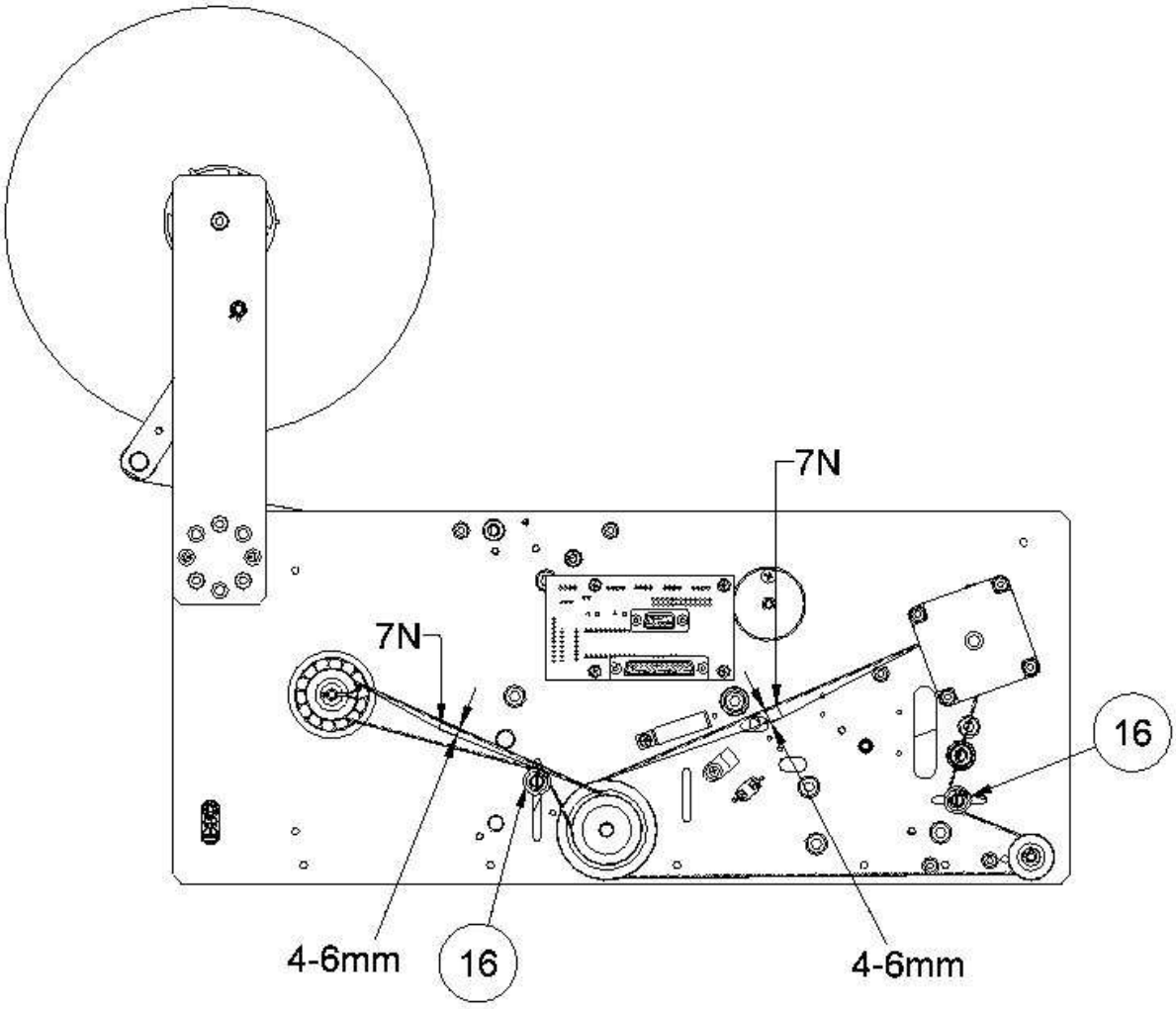


PICTURE 9

11.4. DRIVE BELT REPLACEMENT

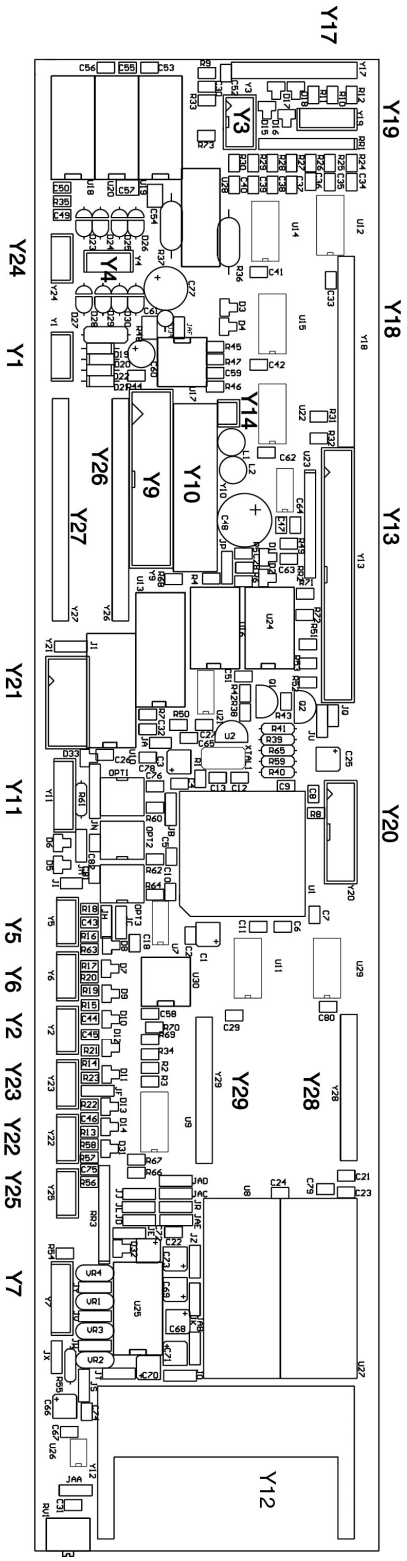
(SEE PICTURE 10)

Remove the connection board and the safeguard plate from the spine, then loosen the relevant idler #16 and remove the belt. Replace the relevant belt and stretch it by the idler till you get a deflection of 4 to 6 mm when applying a force of 7 N.
Reassemble the safeguard plate and the connection board.



PICTURE 10

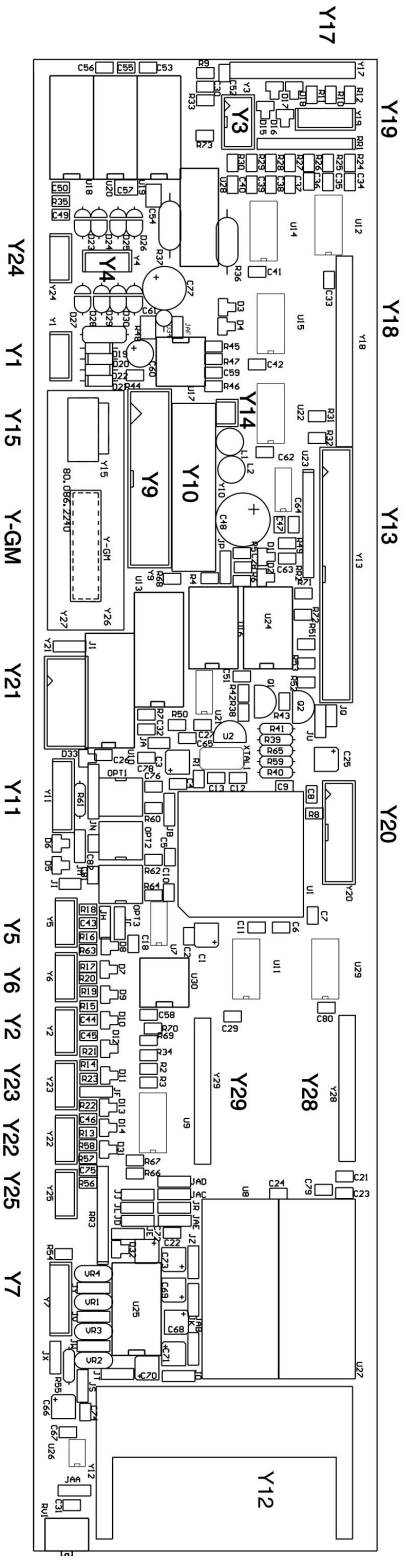
12. SCHEMES



AH 870

Y1	
Y2	**Ribbon sensor**
Y3	**Push button, Leds**
Y4	**Motor**
Y5	**Label sensor**
Y6	**Label taken sensor**
Y7	**Serial port**
Y8	
Y9	**Thermal head**
Y10	**Power supply**
Y11	**Optocouplers**
Y12	
Y13	
Y14	**Fan**
Y15	
Y16	
Y17	
Y18	
Y19	
Y20	
Y21	
Y22	

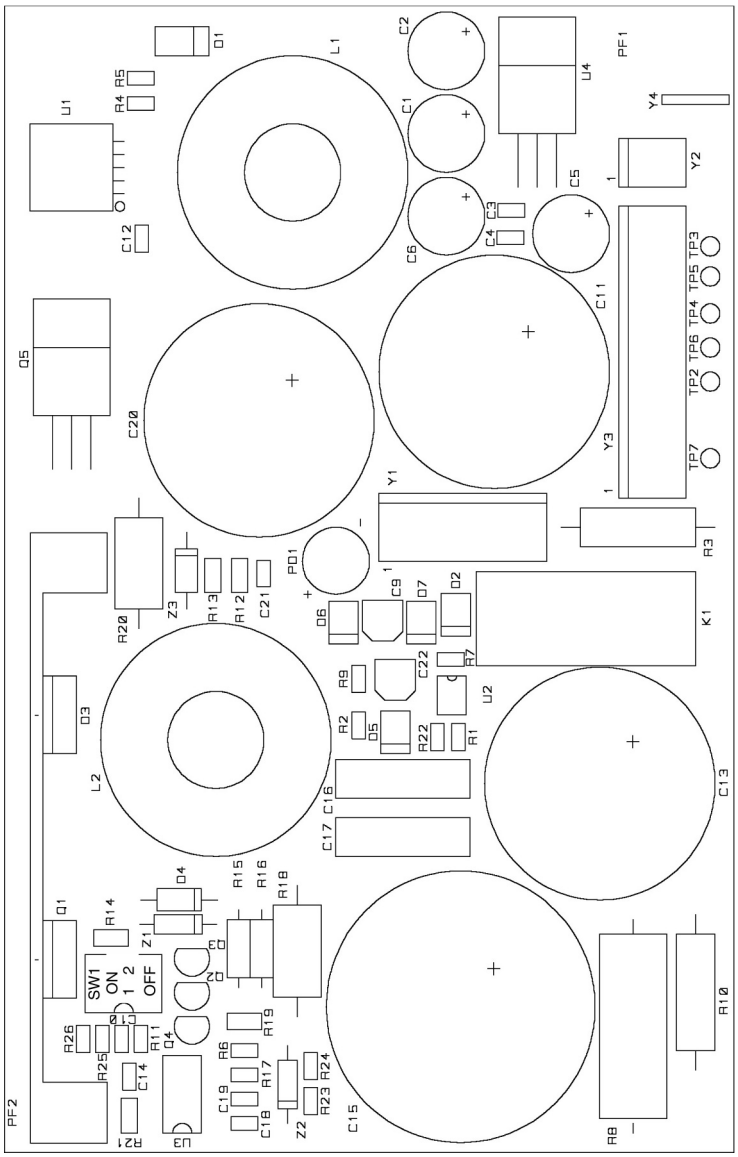
PICTURE 21 AH 870 LOGIC BOARD - layout



AH 871 GM

Y1
Y2 Ribbon sensor
Y3 Push button, Leds
Y4 Motor
Y5 Label sensor
Y6 Label taken sensor
Y7 Serial port
Y8
Y9
Y10 Power supply
Y11 Optocouplers
Y12
Y13
Y14 Fan
Y15 Thermal head (power)
YGM Thermal head (signals)
Y16
Y17
Y18
Y19
Y20
Y21

PICTURE 21 bis AH 871 GM LOGIC BOARD - layout

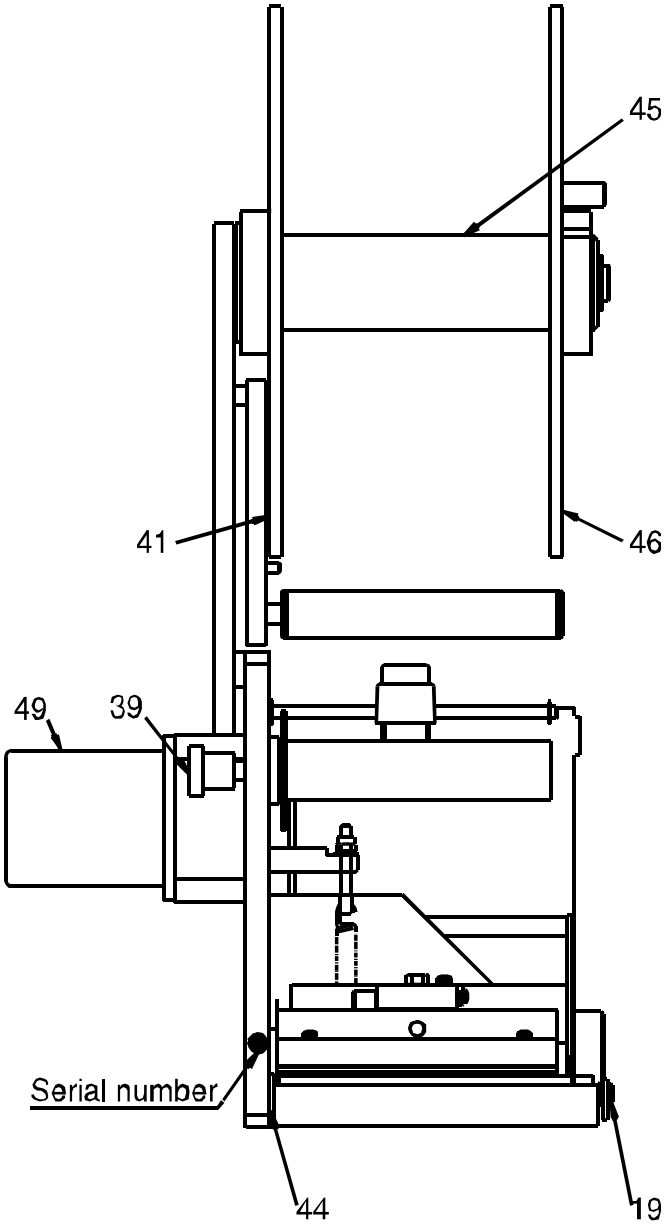


PICTURE 23 POWER SUPPLY - layout

13. PART LIST AND RELEVANT PICTURES

(items are referred to following pictures)

ITEM	CODE	DESCRIPTION	AH 870	AH 871 GM
1	055002101	push button	*	*
2	801665280	DIN connector assy	*	*
3	800925280	ring clip	*	*
4	801292050	filter cap	*	*
5	056102080	fuse 2A T	*	*
6	056102020	fuse 1.6A T	*	*
7	801292090	fuse holder	*	*
8	801665050	RS232 connector	*	*
9	056102030	fuse 8A T	*	*
10	809065080	label photosensor assy	*	*
11	801665250	leds assy	*	*
12	059006010	cable 25 pins, 1000 mm	*	*
13	800945H3002	power board	*	*
14	059006020	cable 9 pins, 1000 mm	*	*
15	80087510208	logic board	*	
15	80087510253	logic board GM		*
16	800925310	belt idler assy	*	*
17	800762090	lever	*	*
18	800722460	nut	*	*
19	061702050	bushing	*	*
20	800872170	connection board (printer)	*	
20	800928523	connection board GM (printer)		*
21	800926510	printing roller	*	*
22	801800104	rewinding pulley assy	*	*
23	800742100	spring	*	*
24	800926520	peeling plate assy	*	*
25	800925890	lever cam	*	*
26	800822011	thermal print head (8 dots)	*	
26	800822720	thermal print head (8 dot GM)		*
27	800925290	knob	*	*
28	801842130	clip holder	*	*
29	800943500	ribbon rewinding assy	*	*
30	800943510	ribbon stock assy	*	*
31	800872180	connection board (electronic cabinet)	*	
31	800928533	connection board GM (electronic cabinet)		*
33	810940029	media position holder assembly	*	*
34	800782180	belt	*	*
35	800949540	driving roller assy	*	*
36	800782080	belt	*	*
37	800542410	ribbon plate	*	*
38	800502271	side panel	*	*
39	801622160	ribbon rewinding gear	*	*
40	800926220	fan assy 60 x 60 mm	*	*
41	801605260	fixed flange assy	*	*
42	051507490	print head flat cable	*	*
44	061702060	bushing	*	*
45	801800103	label unwind holder	*	*
46	801605200	movable flange assy	*	*
47	800926320	heat dissipater assy	*	*
48	801625030	ribbon photosensor	*	*
49	800947640	stepper motor assy	*	*
50	801842501	tie rod	*	*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Serial number
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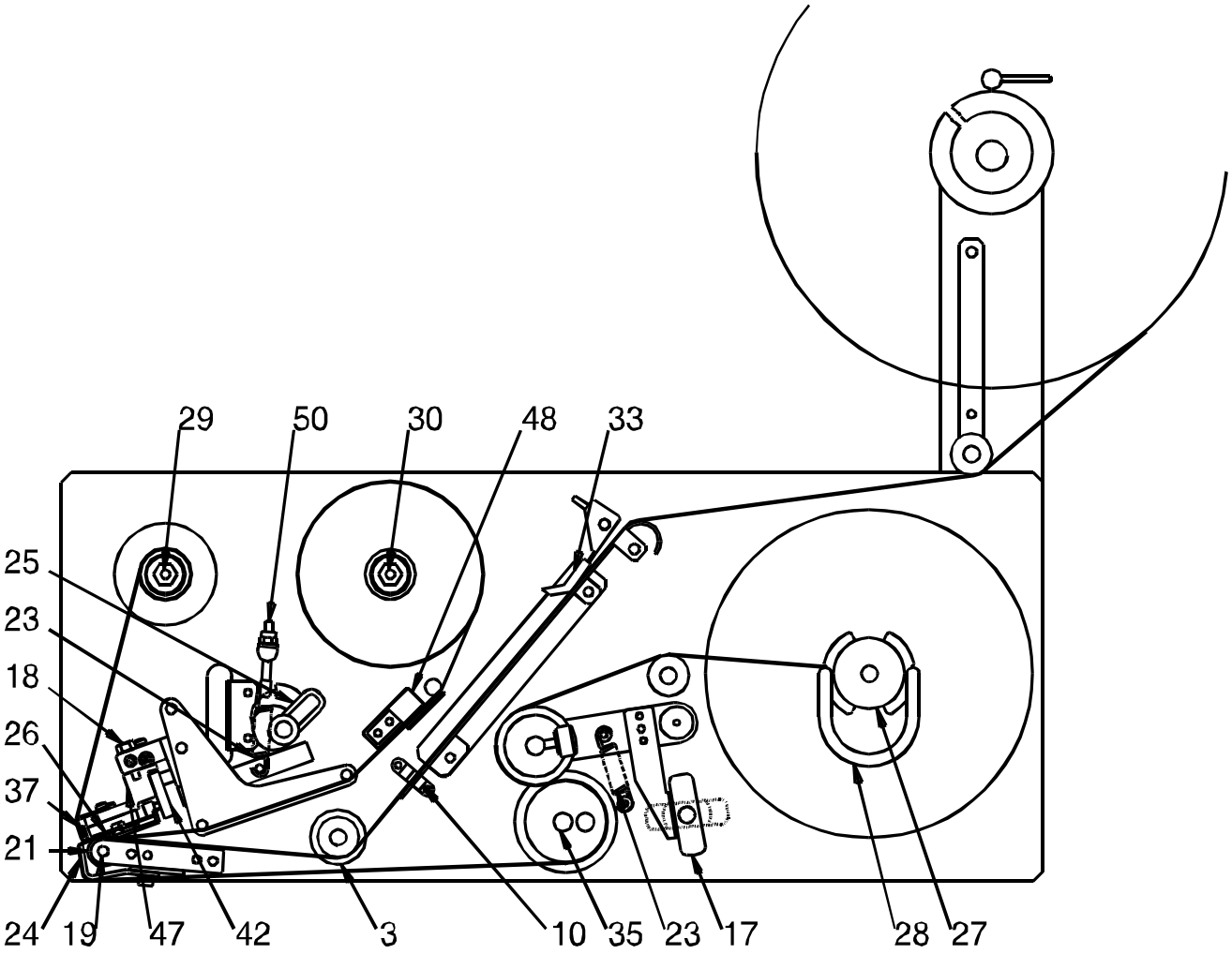
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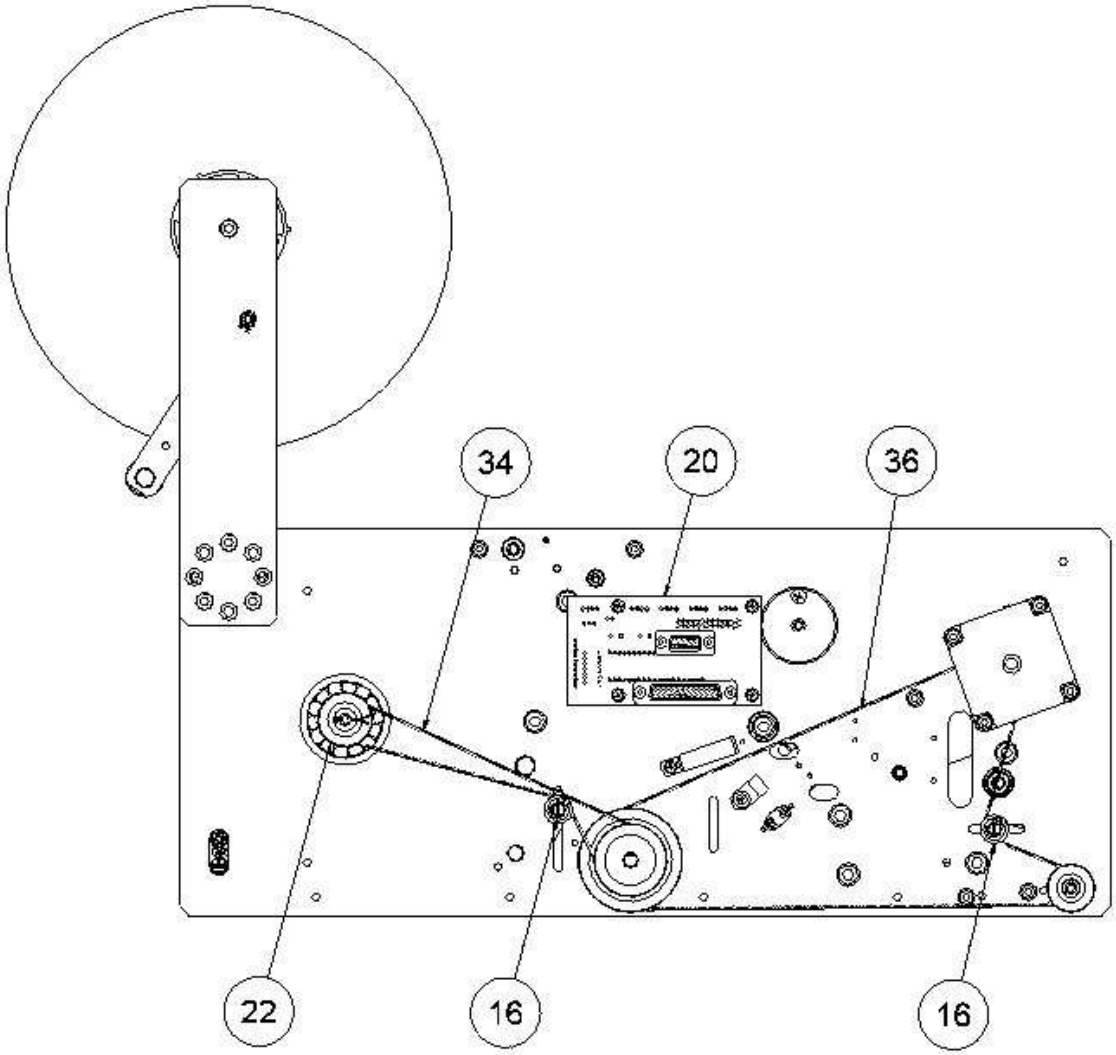
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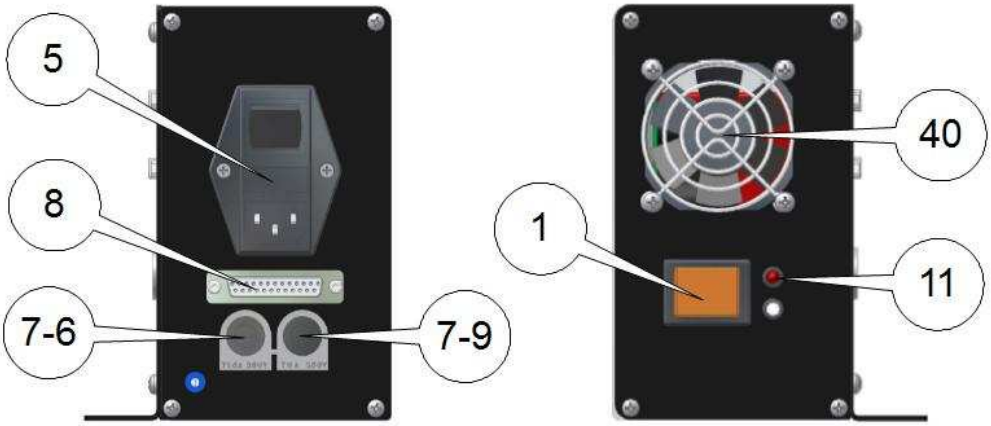
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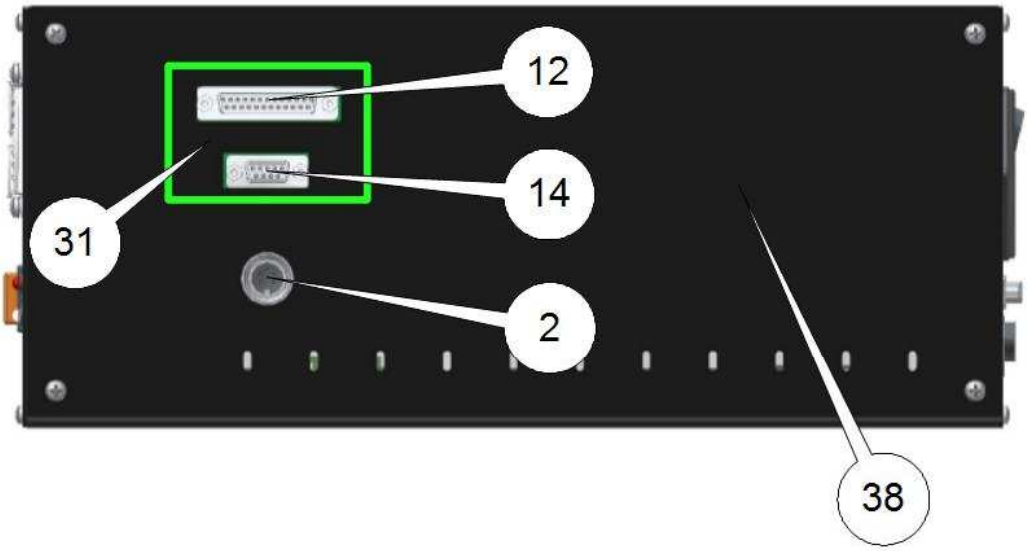
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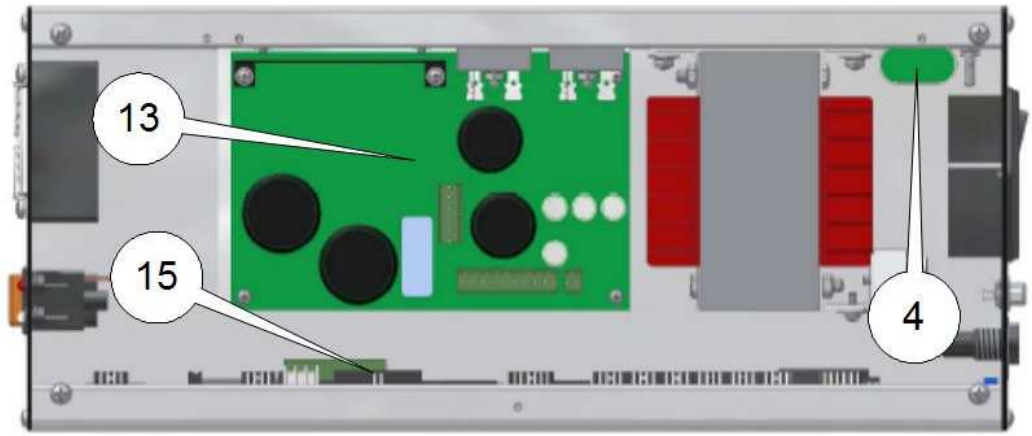
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