INTERMITTENT THERMAL
TRANSFER PRINT MODULES

models

FH 3002 I MK2

USER MANUAL

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Features and specifications are subject to change without notice

FH 3002 I MK2

INTERMITTENT THERMAL TRANSFER PRINT MODULES

1. TECHNICAL SPECIFICATIONS

PRINTING
Method: Thermal Transfer
Resolution: 12 dots/mm (300 dpi)
Print width: 54.2.0 mm
Print stroke 100.0 mm
Print speed: up to 200 mm/s
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

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
HANDSHAKE PROTOCOL
SW : XON/XOFF
HW : DTR
DATA TRANSMISSION
ASCII format
CHARACTER GENERATORS
5 fixed matrix, 6 proportional, up to 112 customized (see Programming Manual for further details)
Magnifications 9x9
MEMORY
32 bit RISC microprocessor
4 MB flash memory
1 MB RAM
DETECTORS
Ribbon cassette opening
End of thermal ribbon
PRINT AREA
Width: 54.2 mm max
Length: 100 mm max
THERMAL RIBBON
Base polyester film, outside coated
Width: 45 mm min/ 60 mm max
Outer diameter: 90 mm max, length 600 meters max
Core diameter: 25.4 mm
PRINTER DIMENSIONS
See following pictures
Weight: 8 Kg (print module)
8 Kg (electronics box)
POWER REQUIREMENTS
Voltage: 115/230/240 Vac; 50-60 Hz
AIR SUPPLY
10 l/min, 6 Bar
ENVIRONMENT
Operating temperature: 0°/ 40° C
Storage temperature: -20°/60° C
Humidity: 10% - 95% non-condensing

2. UNPACKING

Open the box and check the content :

- **italora** print module **FH 3002 I MK2**
- Electronic Control Unit
- Printing platen
- Connection cables:
  serial RS232, DB9, DB25, DB25 for expansion signals
- power cable
- 3 connectors DIN: 3, 4, 5 poles
- roll of thermal ribbon
- printing tests
- CD Rom with manuals and Etik Light

3. GENERAL VIEW

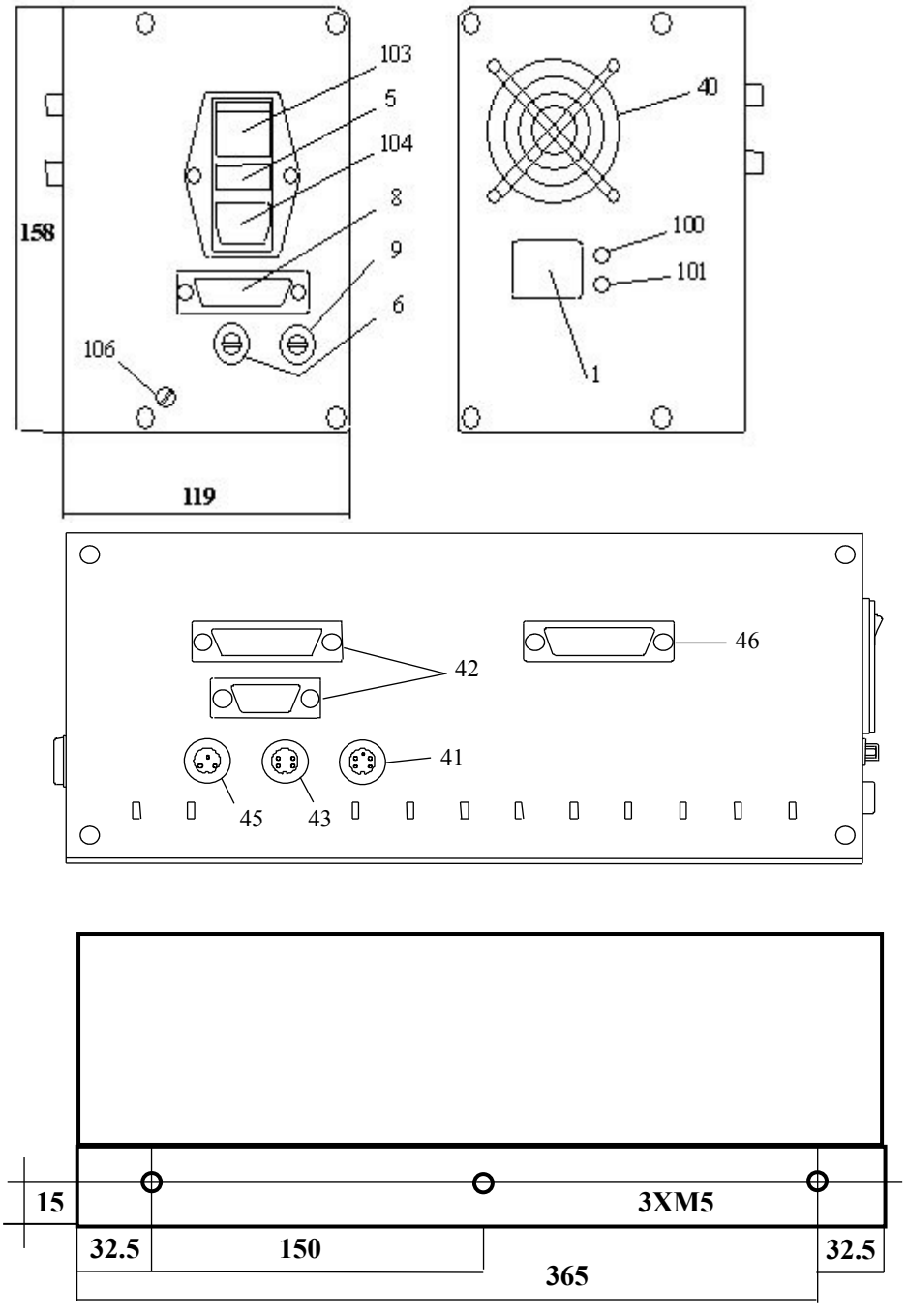
(See picture 1)

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
41 DIN 5p connector - alarm signal
42 connection board
43 DIN 4p connector - print end signal
45 DIN 3p connector - external photocell signal
46 25p connector male CN1

100: **red led** => lit at POWER ON
101: **status led** =>
- **lit green**: ON-LINE
- **lit yellow**: syntax error
(push printing button to restart)
or RIBBON CASSETTE out
- **blinking yellow**: head temperature control active
- **alternate green/yellow blinking**: end of ribbon

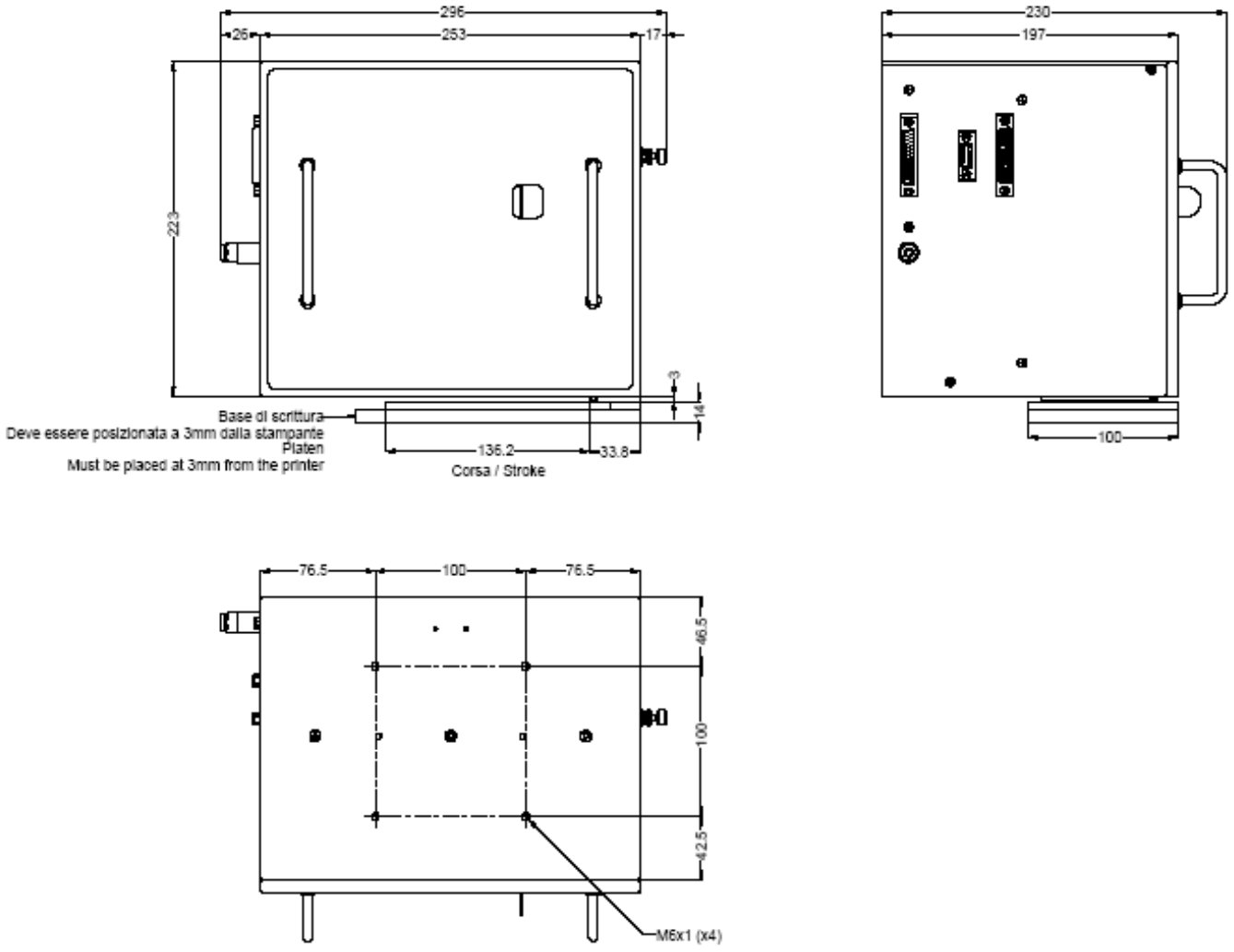
103: main switch
104: power cord plug
106 trimmer for black intensity fine adjust
- clockwise = more intensity
- anticlockwise = less intensity

Electronic Control Unit 80.562.00xx (FH 3002 I MK2)- overall dimensions and fitting holes



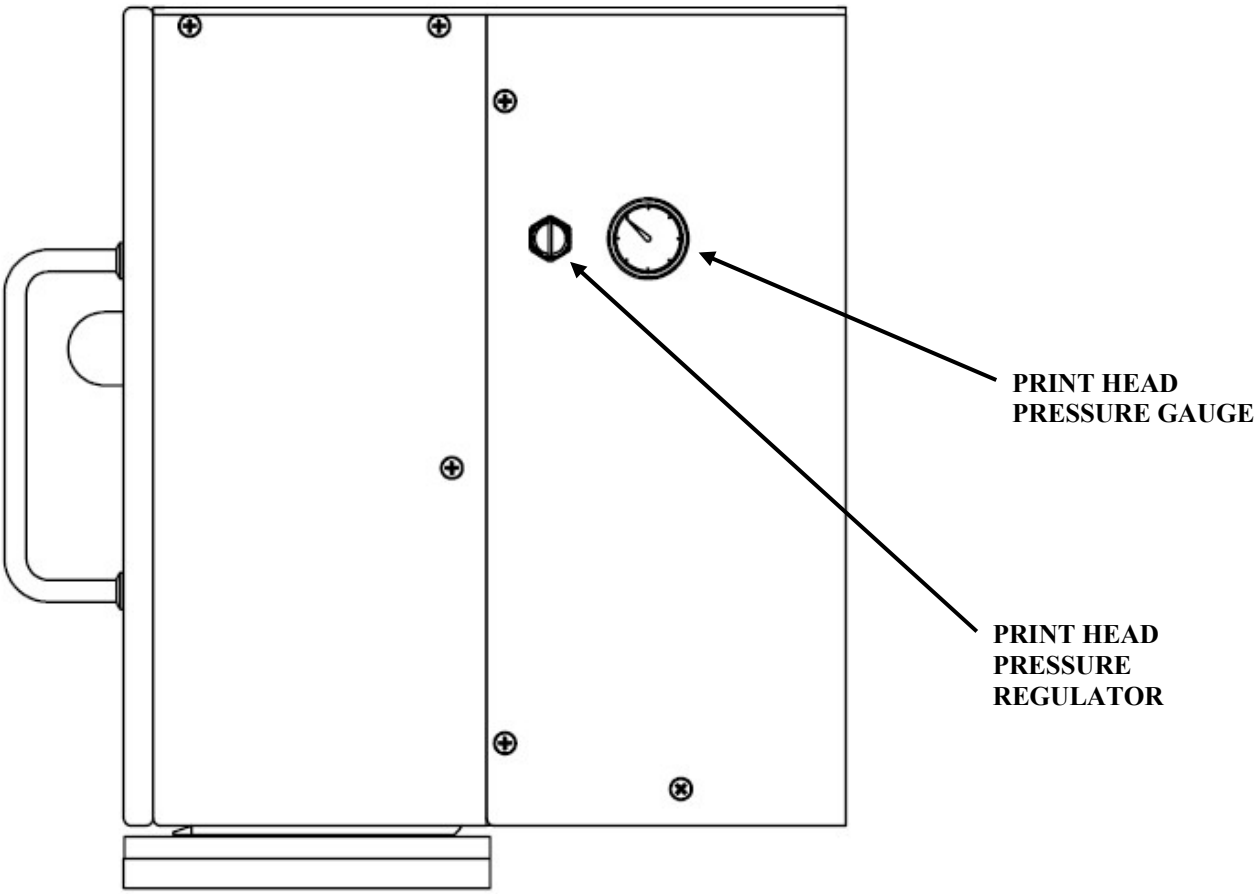
PICTURE 1

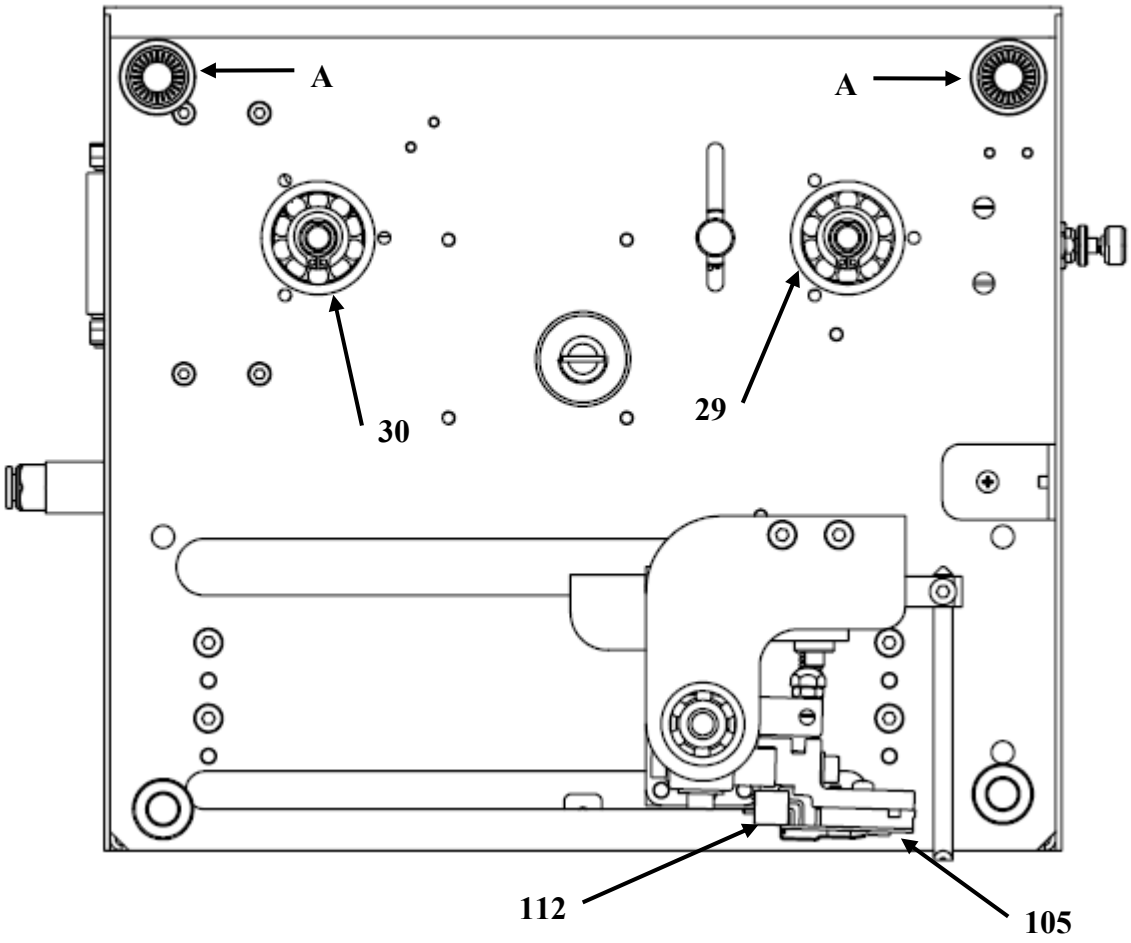
Print module - overall dimensions and fitting holes



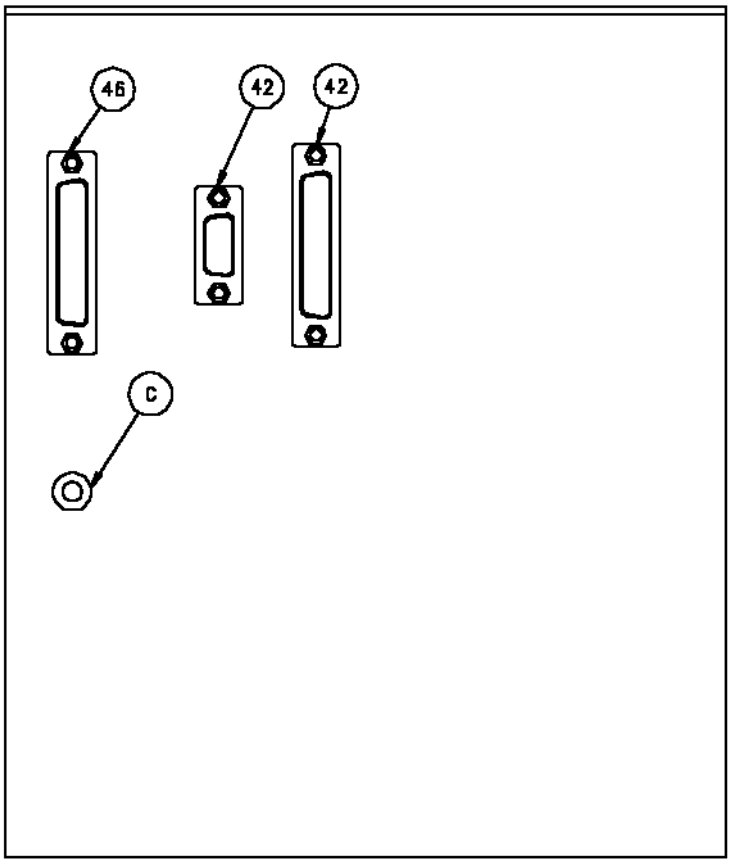
PICTURE 2

4. PRINT MODULE DESCRIPTION





PICTURE 4



PICTURE 5

A - guide holes for ribbon cassette
C - compressed air connector
29 - thermal ribbon rewinder
30 - thermal ribbon stock
42 - connection board
46 - connector CN1
105 - print head assembly
112 - print head connector

5. INCOMING INSPECTION

* Assemble the print module respecting dimensions as shown in picture 6
* Proceed with label and ribbon loading, see chapter 7.
* Connect the print module to the Electronic Control Unit using provided cables.
* Check the correct pinout of the serial Cannon 25 pins female connector and connect the Electronic Control Unit 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.

6. THERMAL RIBBON SPECIFICATIONS

- film thickness 4.5 ÷ 6 micron
- core diameter: 25.4 mm
- outer diameter: 90 mm max
- width: 45 mm min/ 60 mm max
- length: about 600 meters max
- ink coating outside

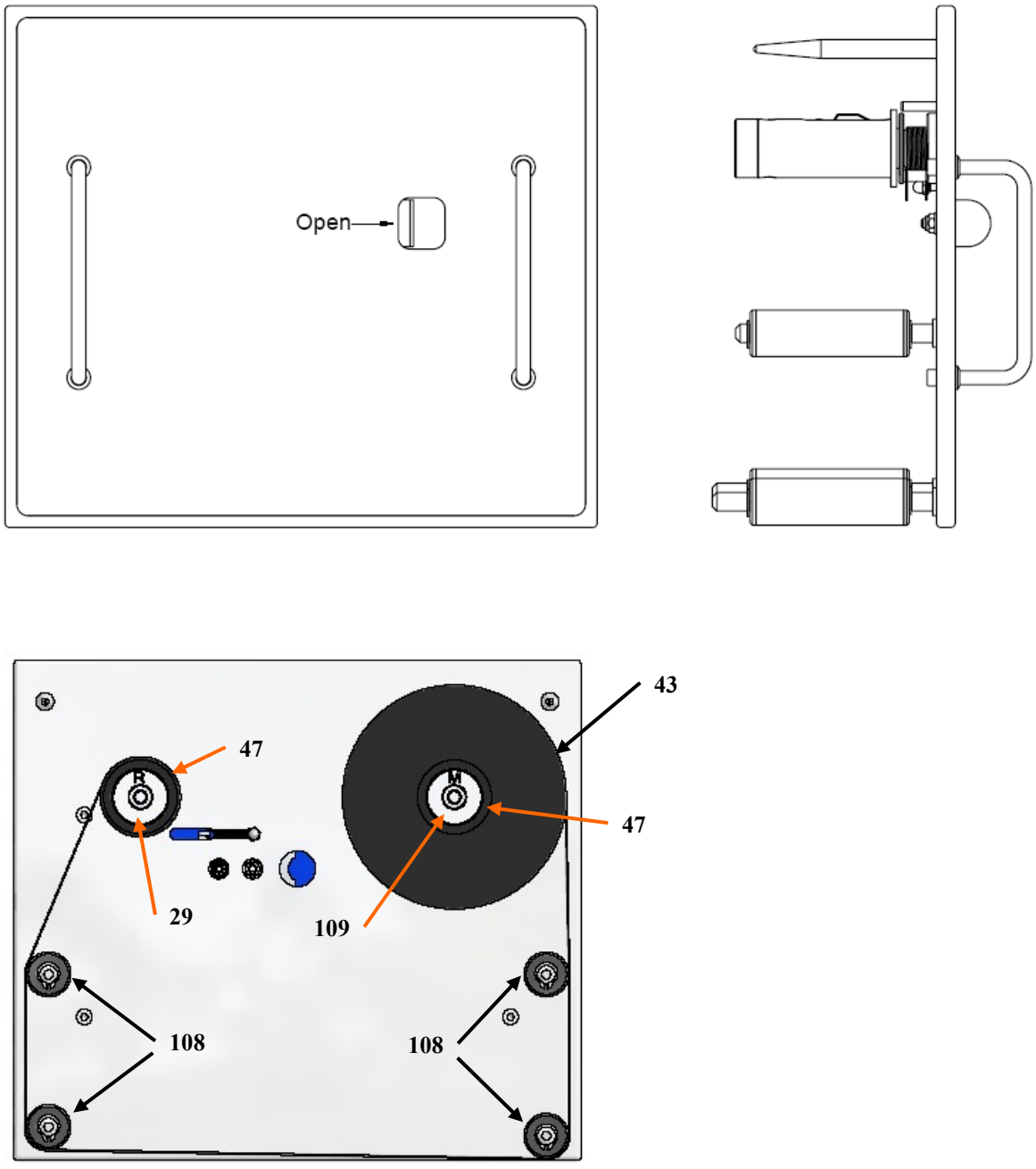
SUGGESTED MODELS
- TOIKO CR 150 (wax resin)
- TOIKO R 300 (resin)

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

7. THERMAL RIBBON REPLACEMENT

(See Picture 7)

To replace thermal ribbon push the lever and pull the ribbon cassette by the two handles.
Remove the used roll.
Remove the core #47 from the shaft #109 and put it on the rewinder #29.
Slide new ribbon #43 onto shaft #109 and thread it under the threaders #108 and up round to the rewinder #29.
Attach the ribbon leader with label/tape to core #47.
Fit the ribbon cassette onto the print module by means of the two stems #A and relevant guide holes. Push the cassette tightly against the print module to lock it.

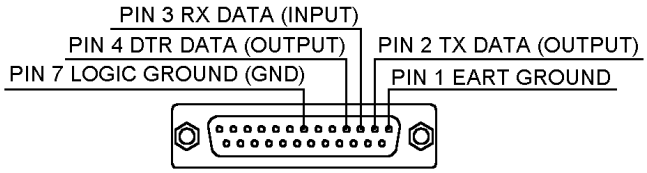


PICTURE 7

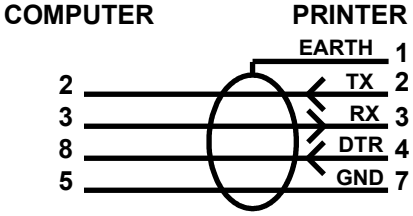
8. INTERFACING

8.1. SERIAL INTERFACE

Electronic Control Units 80.562.00xx for **FH 3002 I MK2** printer mechanisms have a RS232 hardware interface. Provided on board connector is a Cannon 25 pins "DB" female cabled as shown in the following pictures.

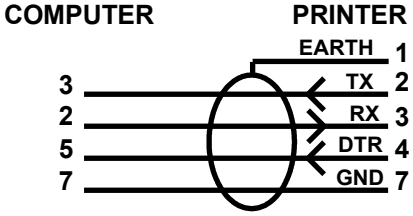


COMPUTER CONNECTOR WITH 9 PINS



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.

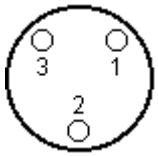
COMPUTER CONNECTOR WITH 25 PIN



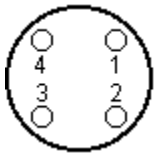
COMPUTER CONNECTOR:
-using sw protocol XON/XOFF:
short together PINS 4-5 and 6-8-20.
-using hw protocol DTR:
short together PINS 6-8-20.

8.2. I/O SIGNALS

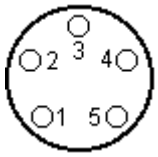
Electronic Control Units 80.562.00xx are provided of three optoisolated lines for I/O signals: one input and two outputs. Connectors type GPE/DIN 40040 are cabled as follows.



START PRINT
1) GND
2) +24V
3) INPUT photocell signal



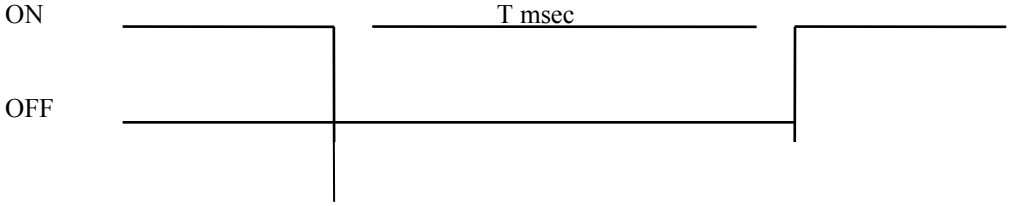
PRINT END
1) GND
2) +24V
3) OUTPUT print end signal
4) not used



ALARM
1) GND
2) +24V
3) OUTPUT alarm signal
4) not used
5) not used

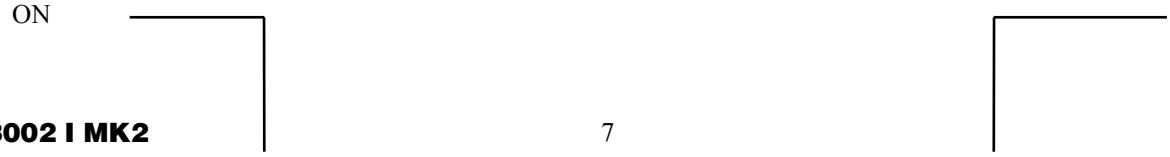
PRINT END output signal gives a pulse when printer has finished to print. It can be programmed in two different ways with the "?66&" software command (see"**PROGRAMMING MANUAL**"):

* "*?66&0*" standard behaviour: a pulse (polarity and length programmable) is driven as soon as the printing has been completed. I.e.:

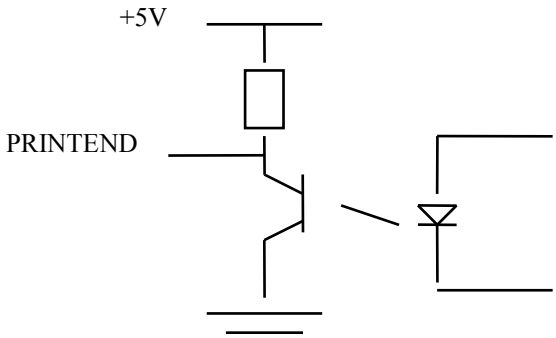


In this case the delay between a printing and its next is, obviously, at least T msec.

* "*?66&1*": the pulse is driven during the whole printing so, in this period, the signal goes low. I.e.:



The electronic circuit is like this:



ALARM output (OUTAUX) is an output signal that changes level when an alarm condition is detected: level is maintained until alarm condition is present.
In end of ribbon condition, together with the traditional led blinking, this auxiliary signal is activated until a new ribbon is loaded.
For more information see "**PROGRAMMING MANUAL**".

START PRINT input signal has same effect of a printing request made by pushing the Print Button located on the front panel of the electronics control box.
For more information see "**PROGRAMMING MANUAL**".

9. MAINTENANCE

WHEN NOT IN USE: SWITCH OFF POWER

9.1. CLEANING

Print Head

- Turn the power off.
- Wait until thermal head cools down.
- Remove 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.

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

Be careful the liquid does not drip on the electronic compartment.

10. TROUBLE SHOOTING

10.1. PRINTING DOES NOT APPEAR

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.

10.2. POOR PRINTING CONTRAST

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

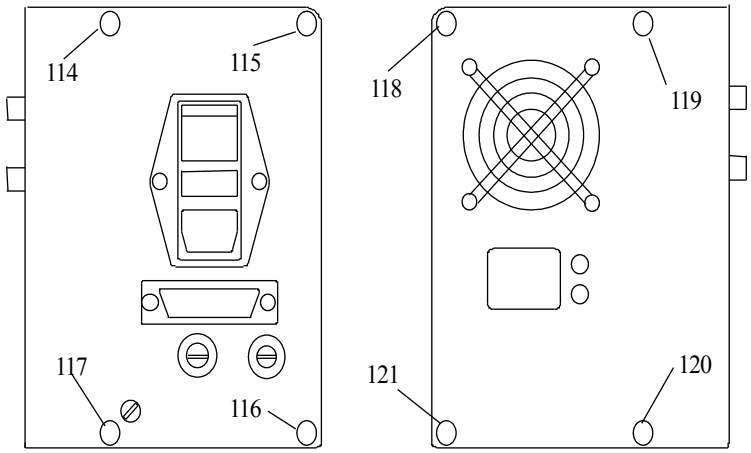
Otherwise use the softare command ?77& (see Programming Manual)

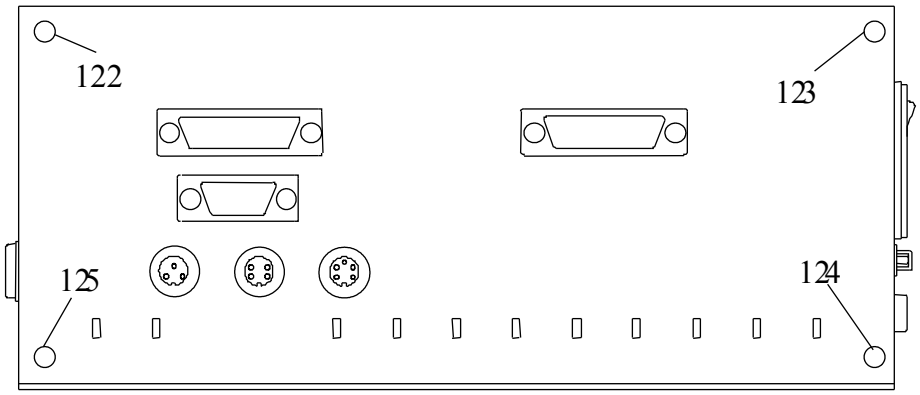
BEWARE: continual high operating temperature of thermal head may reduce its working life and may also fuse the ribbon.

11. HARDWARE NOTES

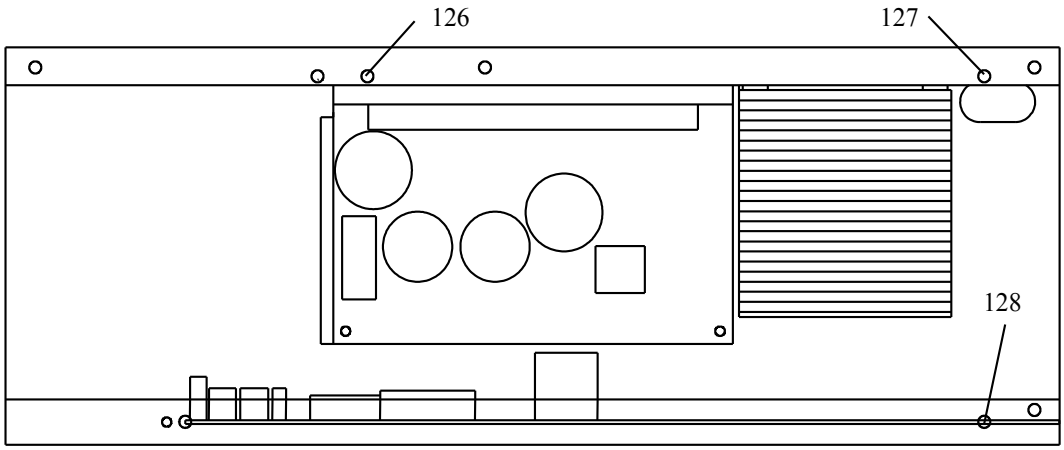
11.1. HOW TO CHECK ELECTRONIC BOARDS

- **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 connectors from CPU board (pict.21).and pull carefully off the electronic boards from the chassis
- 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

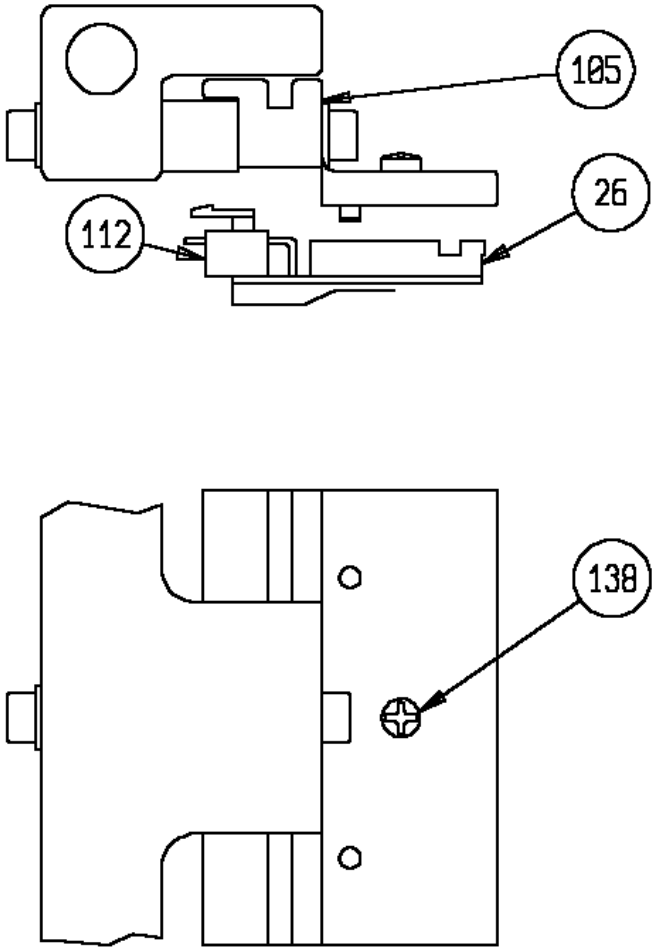
(See picture 9)

1 switch the printer off .

2 unplug the two connectors from the print head.

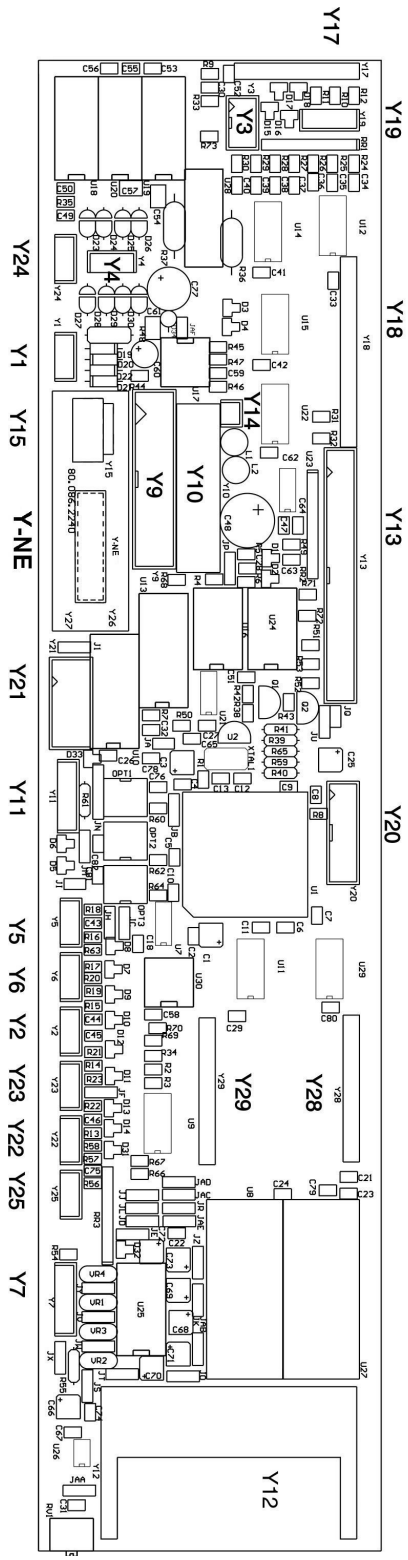
3 turn the screw #138 out and remove the print head #26 from the dissipater.
4 replace thermal head and run back steps 3 to 2.

WARNING: pay attention to plug in correctly thermal head connectors, wrong connection causes irreversible damage to the print head functionality



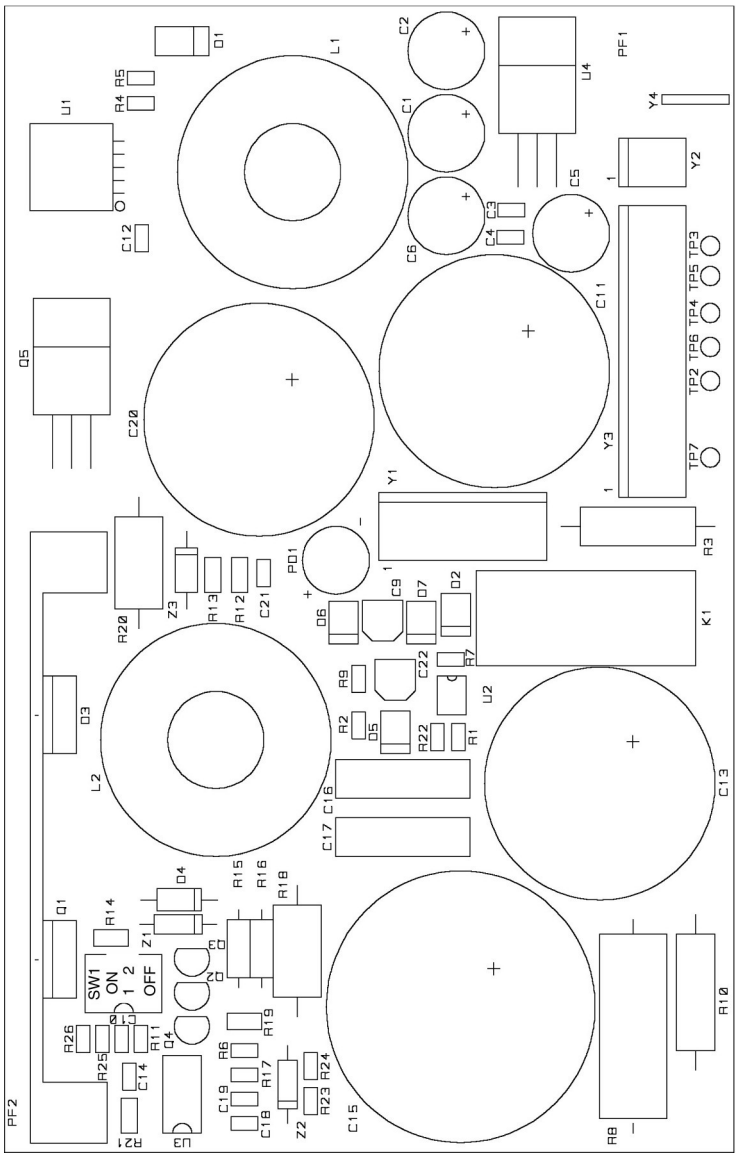
PICTURE 9

12. SCHEMES



Y1	
Y2	
Y3	**Push button, Leds**
Y4	**Printhead carriage motor**
Y5	**Ribbon encoder sensor**
Y6	**Ribbon cassette sensor**
Y7	**Serial port**
Y8	
Y9	
Y10	**Power supply**
Y11	
Y12	
Y13	
Y14	**Fan**
Y15	**Thermal head (power)**
YNE	**Thermal head (signals)**
Y16	
Y17	
Y18	
Y19	
Y20	**I/O signals**
Y21	**I/O signals**
Y22	
Y23	**Home position sensor**
Y24	**Ribbon rewinder motor**

PICTURE 21 LOGIC BOARD - layout

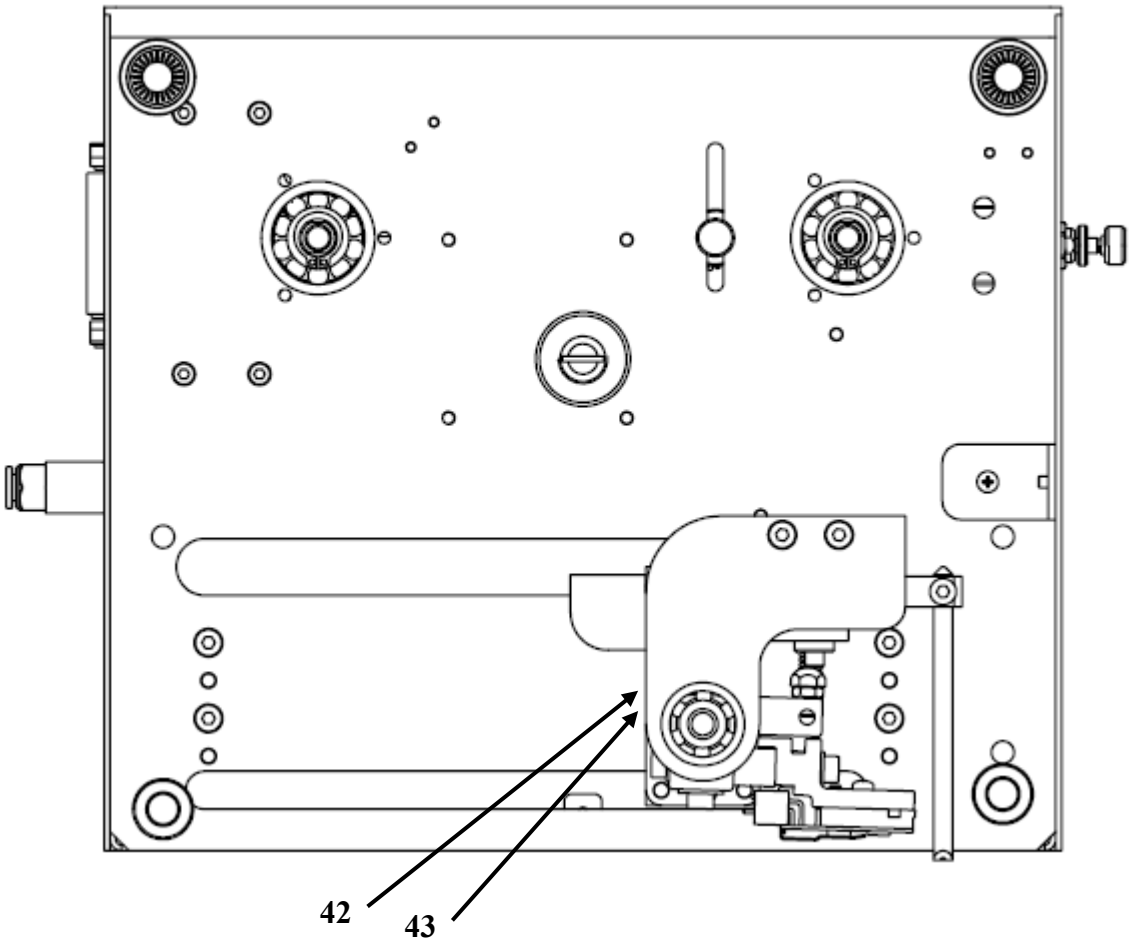


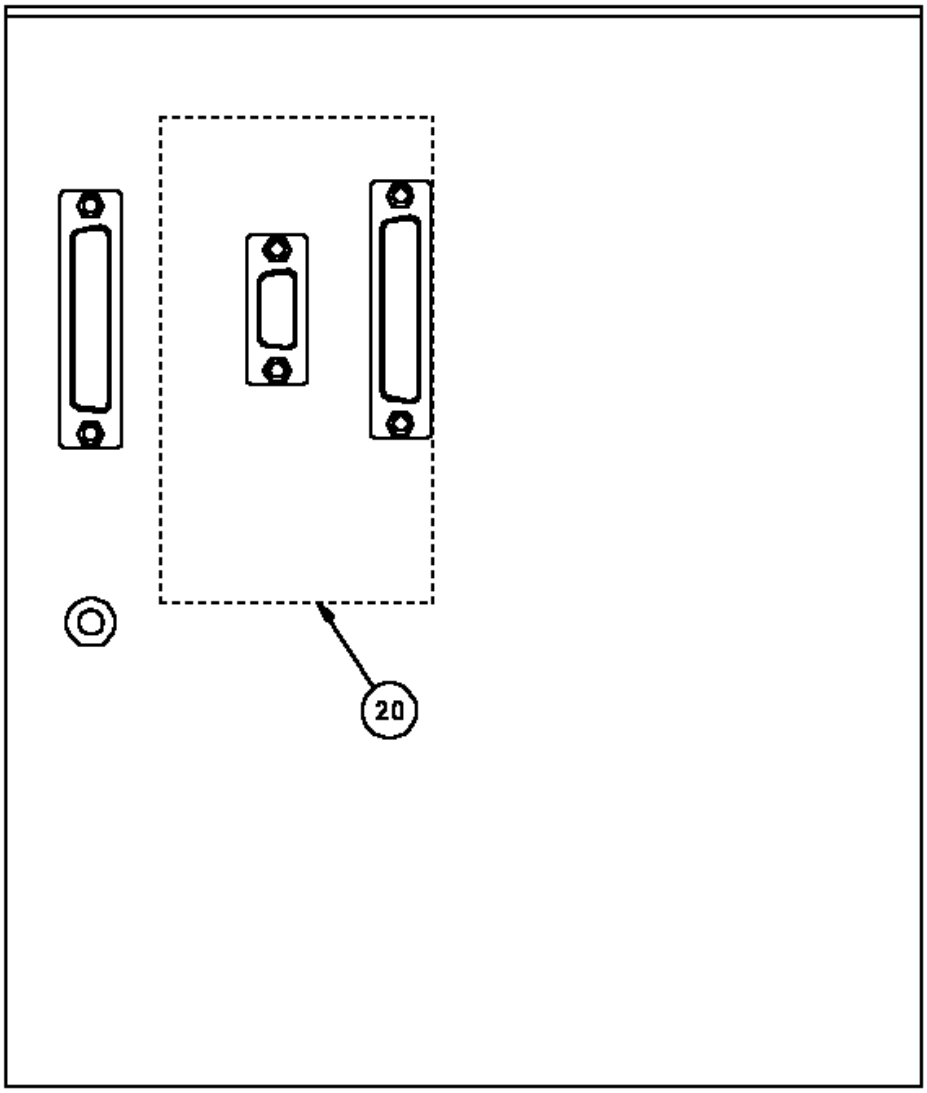
PICTURE 23 POWER SUPPLY - layout

13. PART LIST AND RELEVANT PICTURES

(items are referred to following pictures)

ITEM	CODE	DESCRIPTION	FH 3002 I MK2
1	055002101	push button	*
3	801292070	main switch	*
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	*
11	801665250	leds assy	*
12	059006010	cable 25 pins, 1000 mm	*
13	800945H3002	power board	*
14	059006020	cable 9 pins, 1000 mm	*
15	800875102H3	logic board 256K	*
20	800928522	connection board (printer)	*
26	800822680	thermal print head (12 dots)	*
31	800928532	connection board (electronic cabinet)	*
40	800926220	fan assy 60 x 60 mm	*
42	059006580	print head flat cable	*
43	059006590	print head power cable	*

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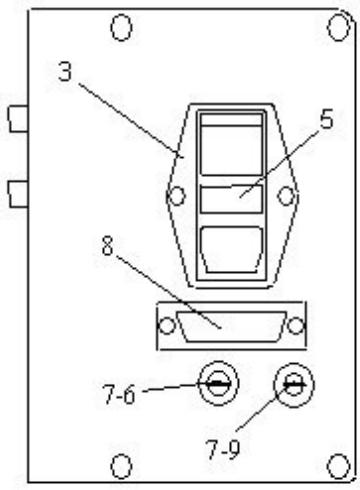
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5
8
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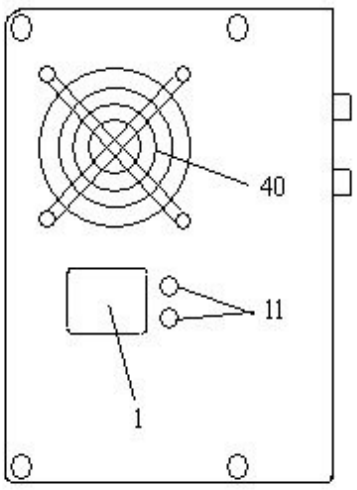
7-9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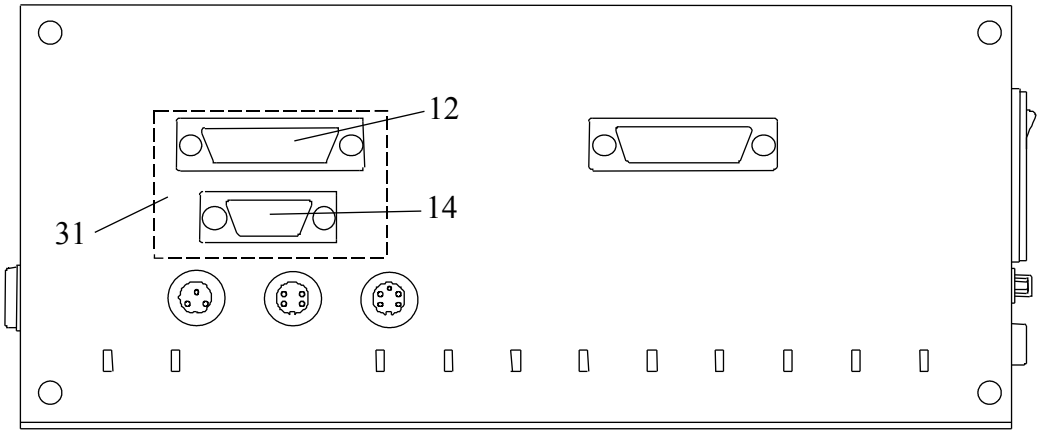
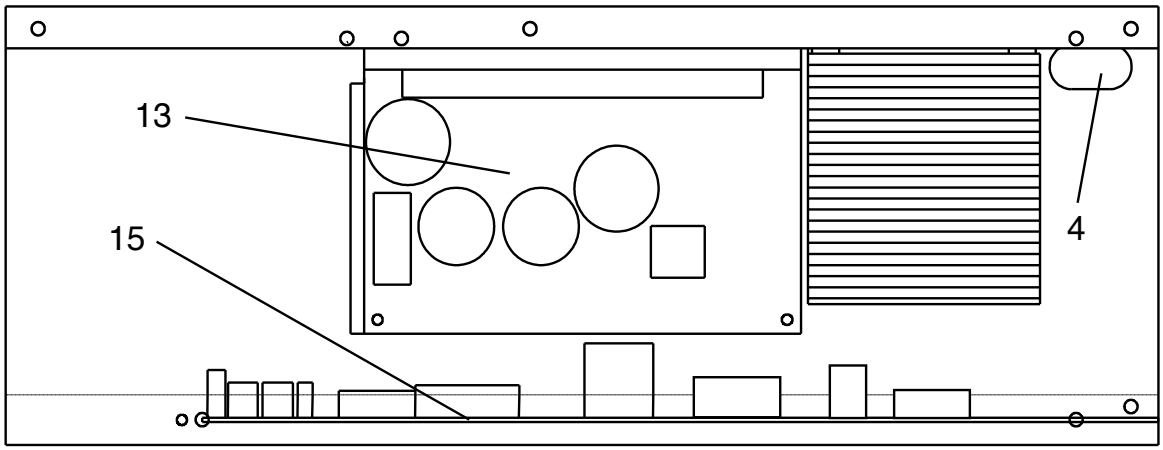
11
1


12
14
31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