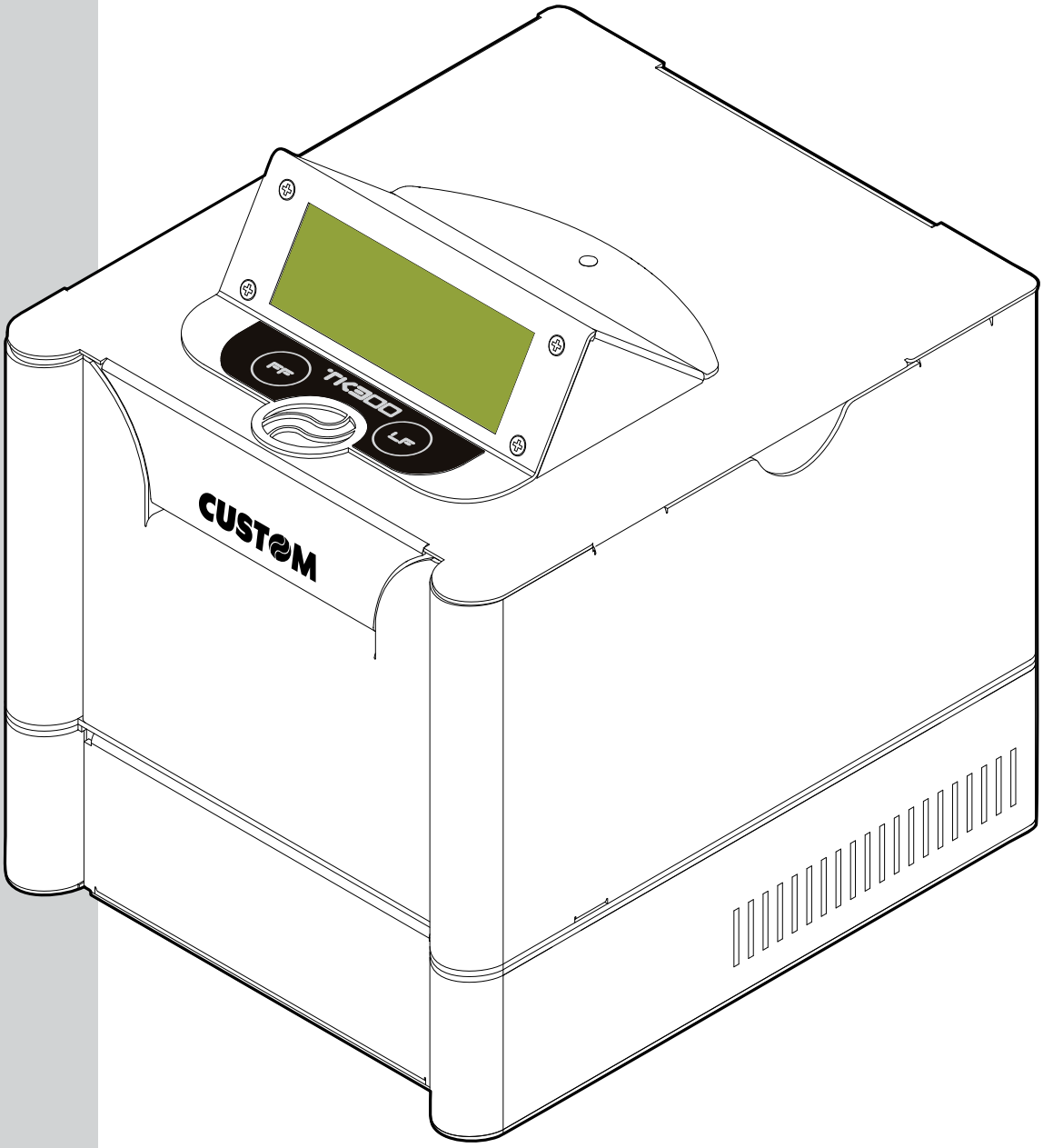
TK300

USER MANUAL

OEM



Command reference: **DOMC-0005e**

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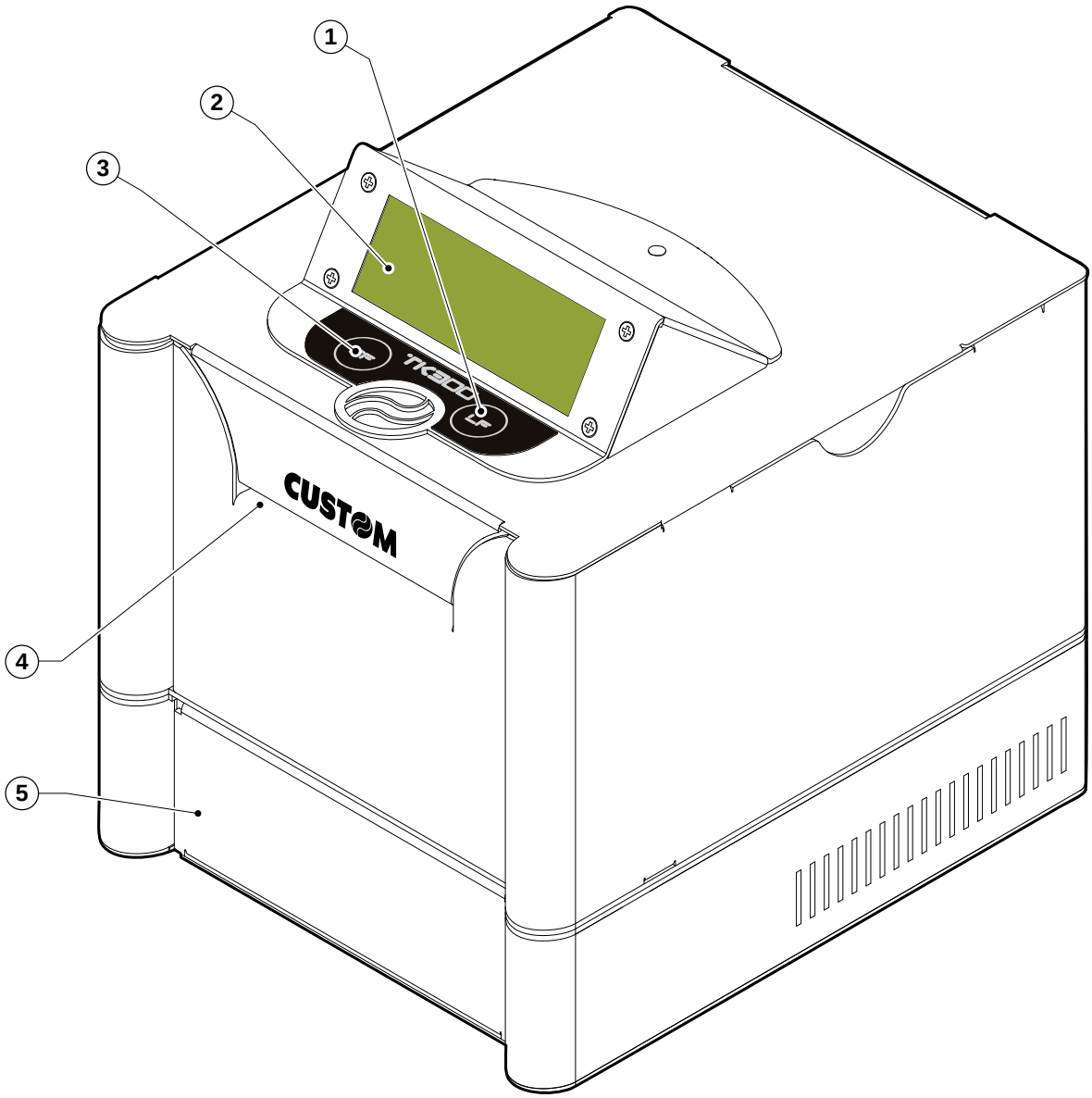
PRINTER COMPONENTS

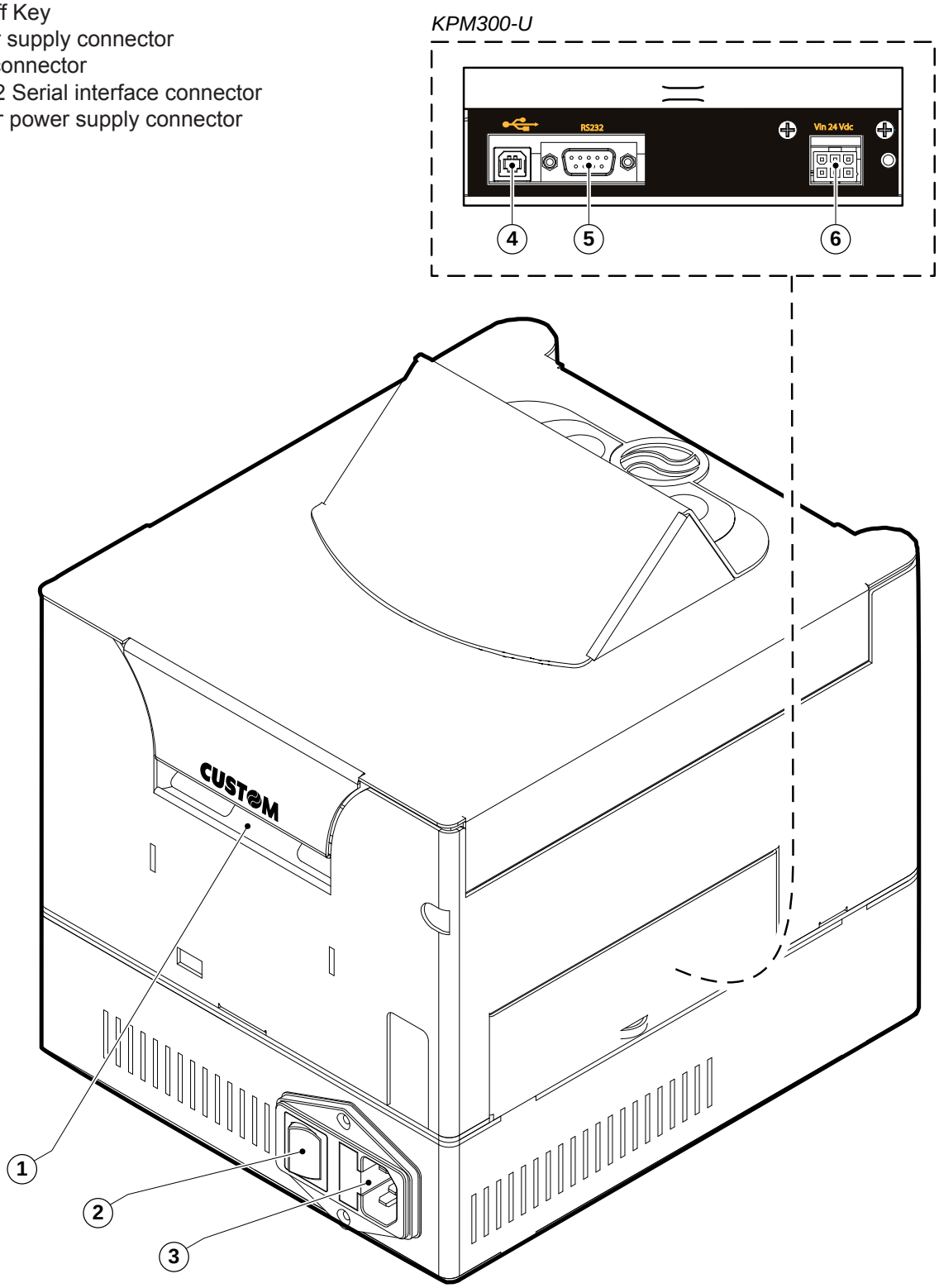
A. TK300 - Front external view

1- “Line Feed” Key
2- Display
3- “Form Feed” Key
4- Paper mouth
5- Power supply space



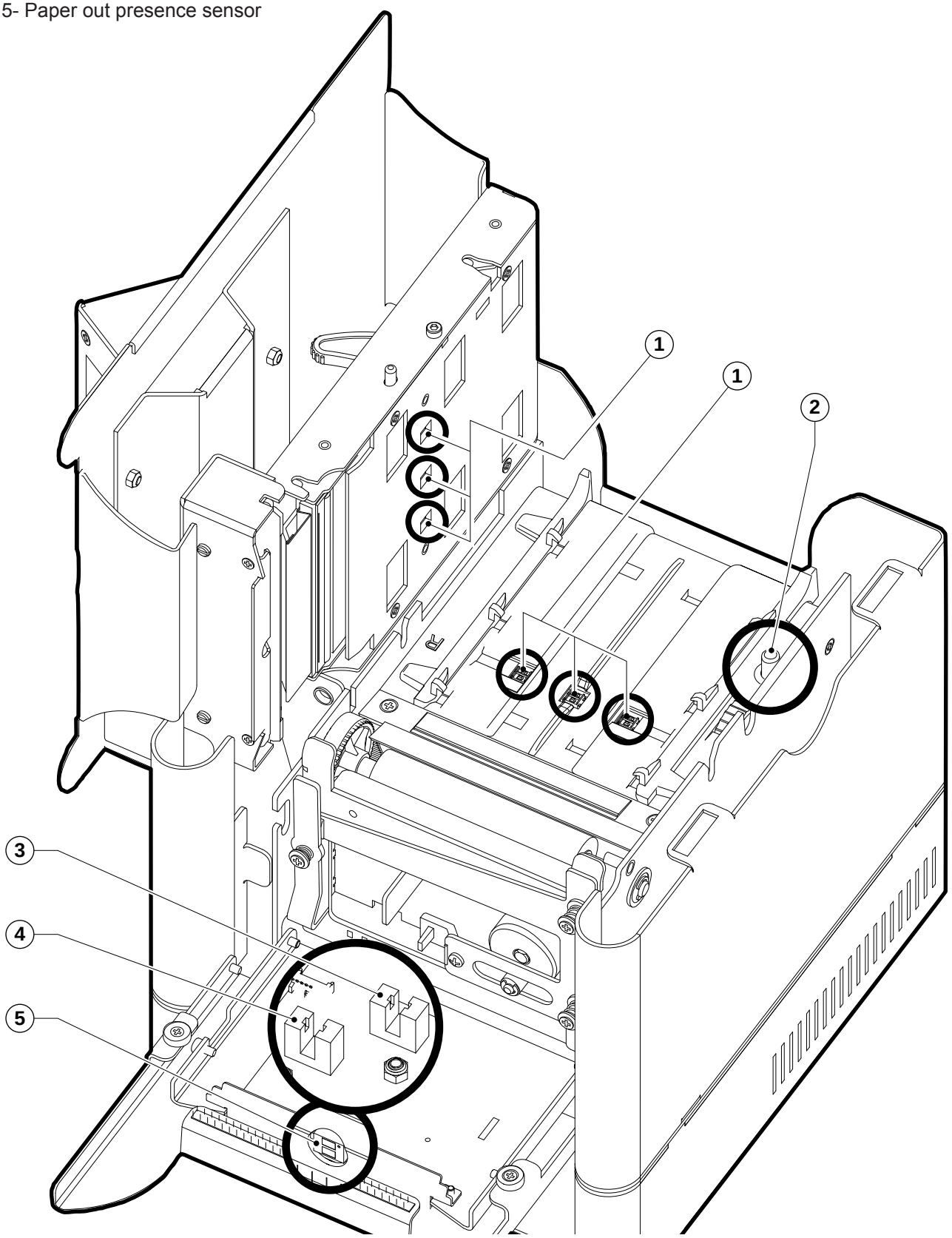
B. TK300 - Rear external view

1- Paper input
2- ON/Off Key
3- Power supply connector
4- USB connector
5- RS232 Serial interface connector
6- Printer power supply connector



B. TK300 - Internal view

1- Paper presence sensor or notch sensor
2- Opening/closing upper cover switch
3- Cutter position sensor
4- Opening/closing front door sensor
5- Paper out presence sensor



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MANUAL CONTENTS

In addition to the Introduction which includes a description of the explanatory notes used in the manual, general safety information, how to unpack the printer and a brief description of the printer including its basic features, this manual is organized as follows:

Chapter 1: Contains the information required for correct printer installation and its proper use
Chapter 2: Contains information on interface specifications
Chapter 3: Contains a description of the printer command set
Chapter 4: Contains Technical Specifications of the printer
Chapter 5: Contains the character sets (fonts) used by the printer

EXPLANATORY NOTES USED IN THIS MANUAL

N.B.
Gives important information or suggestions relative to the use of the printer.

WARNING
Information marked with this symbol must be carefully followed to guard against damaging the printer.

DANGER
Information marked with this symbol must be carefully followed to guard against operator injury or damage.

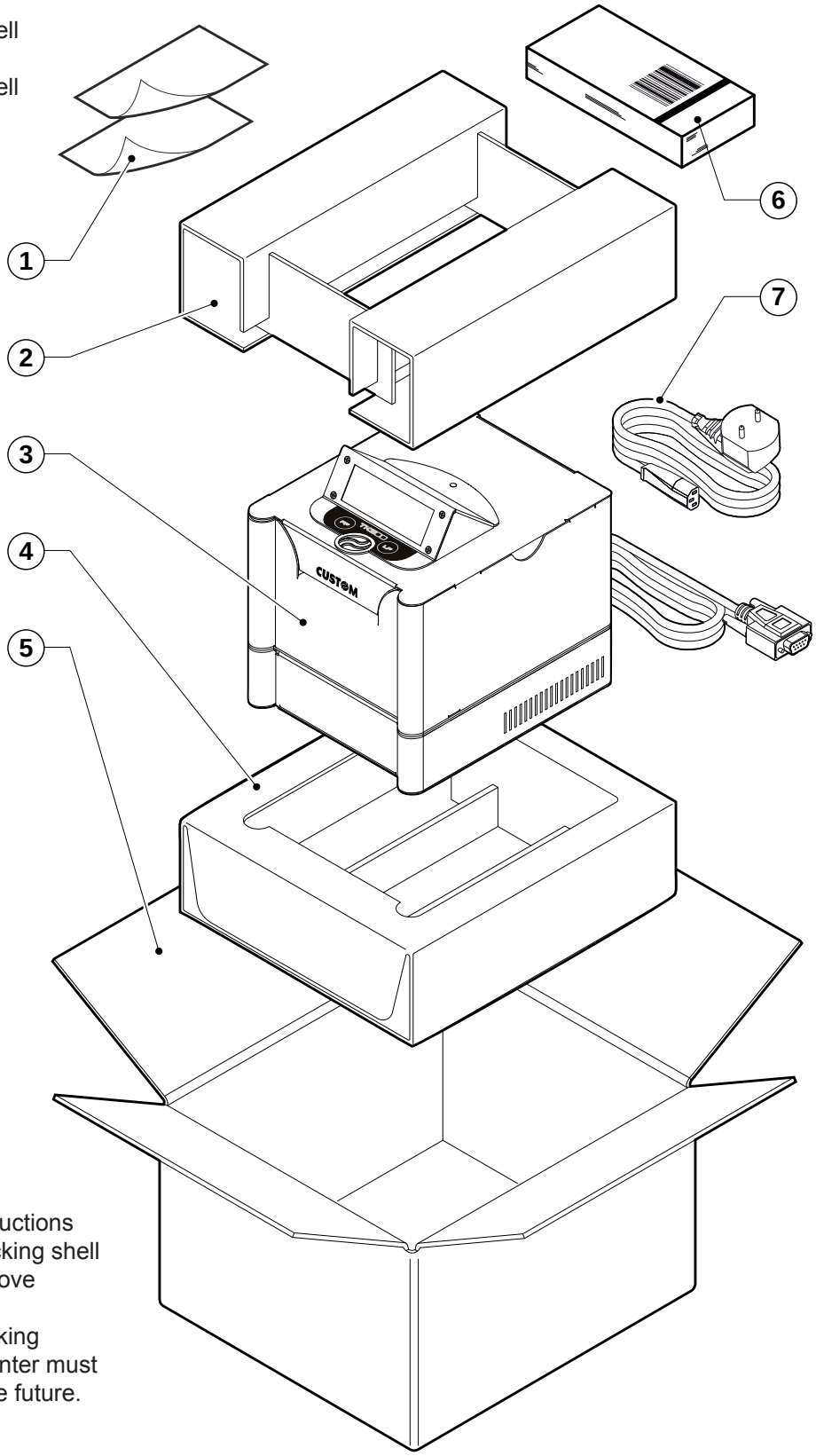
GENERAL SAFETY INFORMATION

- Read and keep the instructions which follow.
- Follow all warnings and instructions indicated on the printer.
- Before cleaning the printer, disconnect the power supply.
- Clean the printer with a damp cloth. Do not use liquid or spray products.
- Do not operate the printer near water.
- Do not use the printer on unstable surfaces that might cause it to fall and be seriously damaged.
- During the integration of the printer, we strongly warn to keep an adeguate paper loop outlet underneath the presenter, in order to allow the receipt being properly printed out.
- Only use the printer on hard surfaces and in environments that guarantee proper ventilation.
- Make sure the printer is placed in such a way as to avoid damage to its wiring.
- Use the type of electrical power supply indicated on the printer label. If in doubt, contact your retailer.
- Do not block the ventilation openings.
- Do not introduce foreign objects of any kind into the printer as this could cause a short circuit or damage parts that could jeopardize printer functioning.
- Do not spill liquids onto the printer.
- Do not carry out technical operations on the printer, with the exception of the scheduled maintenance procedures specifically indicated in the user manual.
- Disconnect the printer from the electricity supply and have it repaired by a specialized technician when:
  - A. The feed connector has been damaged.
  - B. Liquid has seeped inside the printer.
  - C. The printer has been exposed to rain or water.
  - D. The printer is not functioning normally despite the fact that all instructions in the users manual have been followed.
  - E. The printer has been dropped and its outer casing damaged.
  - F. Printer performance is poor.
  - G. The printer is not functioning.

UNPACKING THE PRINTER

Remove the printer from its carton being careful not to damage the packing material so that it may be re-used if the printer is to be transported in the future. Make sure that all the components illustrated below are present and that there are no signs of damage. If there are, contact Customer Service.

1. Installation instructions
2. Upper Foam packing shell
3 Printer with serial cable
4 Lower Foam packing shell
5. Box
6. FanFold module
7. Electrical supply cable



(Fig.1)

- Open the printer packaging
- Remove the paper roll
- Remove the installation instructions
- Take out the upper foam packing shell
- Take out the printer and remove it from its plastic covering.
- Keep the box, trays and packing materials in the event the printer must be transported/shipped in the future.

PRINTER FEATURES

TK300 is a high quality desktop ticket printer for heavy-duty applications equipped with removable external power supply in order to save space and make easier the printer integration.
According with the model it's possible to have the following specification:

- The ARM processor (266MHz) allows high and fast processing capability.
- Customer display of 2 lines by 20 characters.
- Removable power supply.
- Resolution 204 dpi / enhanced quality head.
- High speed printing.

High Quality	120 mm/sec
Normal	200 mm/sec
High speed	250 mm/sec

- Ticket width from 54 to 82,5mm, easily adjustable by the user.
- Paper thickness up to 350/grsqmt.
- Working with paper roll or Fanfold module
- Fanfold holder and paper roll stand are optional.
- RS232 Serial /USB and Ethernet interfaces.
- ESC/POS™ and SVELTA emulation
- Partially or totally programmabe font.
- Sensor: Black mark sensor available in 4 position and translucent gap.
  Ticket sensor.
  Hole mark sensor (set by software).
- Barcode scanner reading pre-printed modules.
- Barcode UPC-A, UPC-E, EAN13, EAN8, CODE39, ITF, CODABAR, CODE93, CODE93, CODE128 e CODE32.
- RFID Reader/writer (mifare/icode).
- MultiMediaCard (64Mb) for logo, font, data storage, expansion is available.

PRINTER DESCRIPTION

The printer (fig.2) is comprised of a metal frame, printing mechanism, a cutter and an ejector. Located on the external keypad are the following keys: LF LINE FEED (2), FF FORM FEED (3) and Status Display (6). Located on the internal keypad are the following keys: LF LINE FEED (2), FF FORM FEED (3) S1 key (4), S2 key (5) and Status LED (1).

- LF LINE FEED key. When the LINE FEED key is pressed, the printer advances the paper so that the paper may be inserted in the printing mechanism. During power-up, if the LF LINE FEED key is held down, the printer enters the SETUP routine and print the SETUP report. The printer will remain in standby in Hexadecimal dump mode until another key is pressed or characters are received through the printer communication port; for every 24 characters received it prints hexadecimal values and ASCII codes (if the characters appear underlined, it means the receive buffer is full). See Hexadecimal Dump.

- FF FORM FEED key. When the FF FORM FEED key is pressed, (if the alignment command is enable) the printer advances the paper by a pre-set length and perform the cut. During power-up, if the FF FORM FEED key is held down, the printer will perform the FONT TEST routine.

- S1 key. When the S1 key is pressed, no operations is executed. During power-up, if the S1 key is held down, the printer will start self-calibration of the notch sensor and will perform the paper characterization.

- S2 key. When the S2 key is pressed, no operations is executed. During power-up, if the S2 (*) key is held down, the printer enter in a special programming mode (see service manual).

- STATUS DISPLAY displays printer hardware status. In case of malfunction, a short message is displayed.
- STATUS LED displays printer hardware status. In case of malfunction, the colour and flash frequency changing as follows:

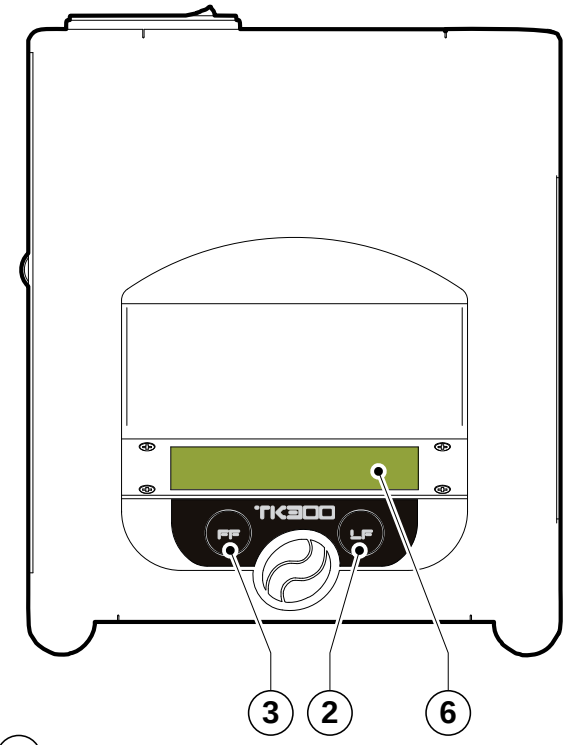
NOTE
The FF FORM FEED and LF LINE FEED keys on the external and internal panel have the same functions.

(*) NOTE
This is a modality that becomes unusable by keys; if this event occurs then turn off the printer and turn on without pressing any key.

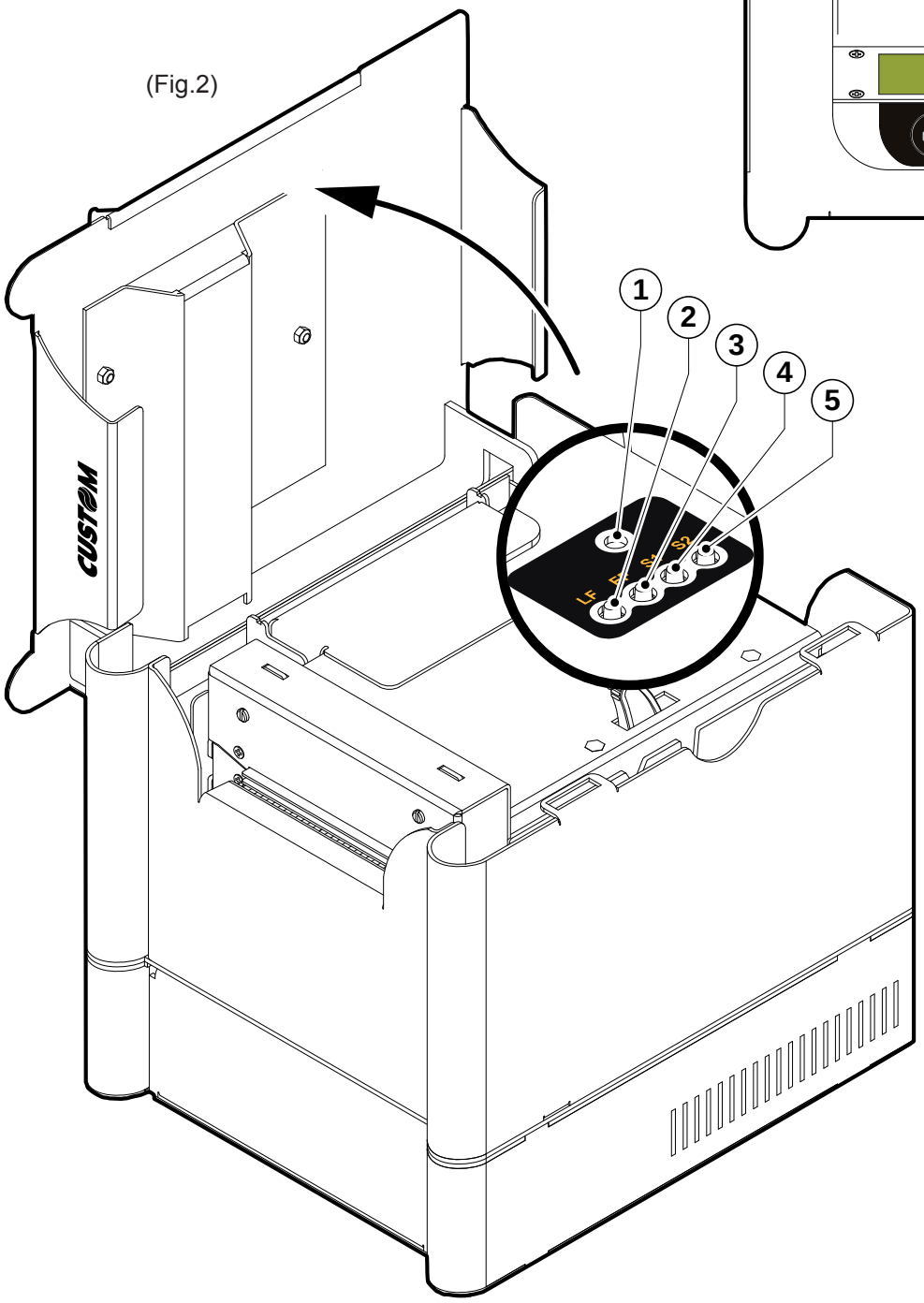
(Tab.1)

STATUS LED	COLOUR	DESCRIPTION	
○	TURNED OFF	Printer Off	
●	GREEN	Printer on: no error	
☀	GREEN	**COMMUNICATION STATUS**	
		No. Flashing	Description
		1	Receive data
		2	Reception errors (parity, frame error, overrun error)
		3	Misinterpret command
		4	Command reception time out
☀	YELLOW	**RECOVERING ERROR**	
		No. Flashing	Description
		2	Heading over temperature
		3	Paper end
		4	Paper jam
		5	Power supply voltage incorrect
		6	Cover opened
☀	RED	**UNRECOVERING ERROR**	
		No. Flashing	Description
		3	RAM error
		4	EEPROM error
		5	Cutter error
		6	Cutter cover error

(Fig.3)



(Fig.2)



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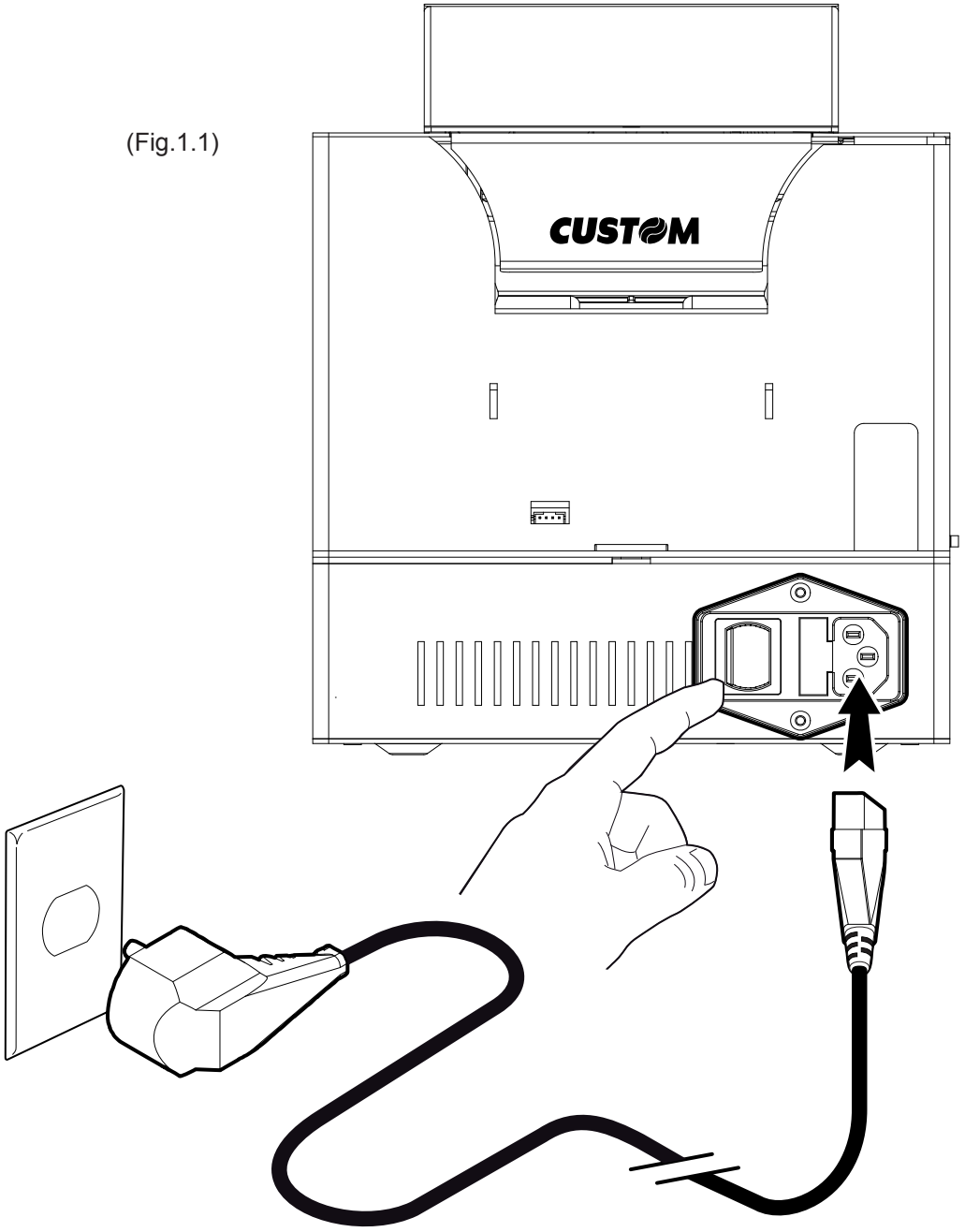
1.1 CONNECTIONS

(Fig.1.1)



1.1.1 Power Supply

Connect the power supply cable with the printer and the wall socket (see Fig.1.1).

WARNING:
Before connecting the power supply cable make sure the voltage value is correct.

1.2 SELF-TEST

Printer operating status is indicated in the configuration print-out in which, next to the name of the components displayed (see fig.1.2), the following information is given:

• under INTERFACE is given the interface present (RS232).
• under PROGRAM MEMORY TEST, DYNAMIC RAM TEST, EEPROM TEST and CUTTER TEST, the message OK appears if functioning and NOT OK if faulty.
• under HEAD VOLTAGE is given the voltage of the head.
• under HEAD TEMPERATURE is given the temperature of the head.
• under POWER ON COUNTER is given the number of power-ups made.
• under PAPER PRINTED is given the number of centimetres of paper printed.
• under CUT COUNTER is given the number of cuts made.

PRINTER SETUP

PRINTER TYPE KPM300
PRINTING HEAD TYPE KPA80
INTERFACE RS232
PROGRAM MEMORY TEST.....OK
DYNAMIC RAM TEST.....OK
EEPROM TEST.....OK
CUTTER TEST.....OK
PRINTER HEAD Rav 624
HEAD VOLTAGE [V] = 24,29
HEAD TEMPERATURE [°C] = 26
POWER ON COUNTER = 28
PAPER PRINTED [cm] = 40
CUT COUNTER = 573

Printer Emulation .....: **ESC/POS (TM)**
RS232 Baud Rate (1) .....: **115200 bps**
RS232 Data Length (1) .....: **8 bits/chr**
RS232 Parity (1) .....: **None**
RS232 Handshaking (1) .....: **Xon/Xoff**
Busy Condition (2) .....: **RxFull**
USB Status Monitor (3) .....: **Disabled**
USB Address Number (4) .....: **0**
Autofeed (5) .....: **CR Disabled**
Print Mode .....: **Normal**
Chars / inch (5) .....: **A=15 B=20 cpi**
Speed / Quality.....: **Normal**
Paper Width.....: **82 mm**
Paper Threshold.....: **60%**
Notch Position .....: **Low Center**
Notch Threshold (6).....: **40%**
Notch Distance [mm] (6).....: **00**
PaperEnd Buffer Clear .....: **Disabled**
Print Density.....: **0%**

(Fig.1.2)

(1) NOTE: Parameter valid only with serial interface.

(2) NOTE: Parameter valid only with serial interface; using this parameter, it is possible to select whether the Busy signal is activated when the printer is both in Off Line status and the buffer is full, or only if the reception buffer is full.

(3) NOTE: This parameter is displayed if the printer has an USB interface. The Status Monitor is an additional printing driver component that allows the printer status monitoring. It must be enabled only if it was installed the Status Monitor specific driver.

(4) NOTE: This parameter is displayed if the printer has an USB interface; it's used to identify univocally the USB printer by a numerical address code, if on the PC are connected two printers that are the same models for example two USB printers.

(5) NOTE: This parameter is displayed if the printer emulation is set to ESC/POS™.

(6) NOTE: If the "Notch Position" parameter is set to "Disabled" this parameter doesn't appear in the "Printer Setup" report.

1.3 CONFIGURATION

The printer permits the configuration of default parameters. The parameters that relate to configuration are:

Printer Emulation: SVELTA[D], ESC / POS™.
RS232 Baud Rate: 115200[D], 57600,38400, 19200, 9600, 4800, 2400, 1200.
RS232 Data length: 7, 8[D] bits/char.
RS232 Parity: None[D], even or odd.
RS232 Handshaking: XON/XOFF[D] or Hardware.
Busy Condition: OffLine/RxFull or RxFull[D].
USB Status Monitor: Disabled[D] or Enabled.
USB Address Number: 0[D], 1, 2, 3, 4, 5, 6, 7, 8, 9.
Autofeed: CR disabled[D] or CR enabled.
Print mode: Normal[D] or Reverse.
Chars/inch: A=11 B=15 cpi, A=15 B=20 cpi[D].
Speed/Quality: High Quality, Normal, High Speed[D].
Paper width: 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82[D] mm.
Paper Threshold (7): 30% [D], 40%, 50%, 60%, 70%, 80%, 90%.
Notch Position (8): Disabled[D], Low Side, Up Side, Low Center, Up Center, Tr. Side, Tr. Center.
Notch Threshold (9): 30%, 40%[D], 50%, 60%, 70%, 80%, 90%.
Notch distance signum (6): +[D], -.
Notch dist. [mm x 10](6)(10): 0[D], 1, 2, 3, 4, 5, 6, 7, 8, 9.
Notch dist. [mm x 1](6)(10): 0[D], 1, 2, 3, 4, 5, 6, 7, 8, 9.
Notch dist. [mm x .1](6)(10): 0[D], 1, 2, 3, 4, 5, 6, 7, 8, 9.
PaperEnd Buffer Clear: Disabled[D] or Enabled.
Print Density: -50%, -37%, -25%, -12%, 0%[D],+12%,+25%,+37%, +50%.

GENERAL NOTES: The parameters marked with the symbol [D] are the default values.

(7) NOTE: This parameter indicates the threshold value under the sensor detect the paper.

(8) **NOTE:** This parameter sets which sensor is used as notch sensor. There are two sensor operating mode: reflection or transparence *(for more details see paragraph 1.6)*.

(9) **NOTE:** This parameter is used to detect the presence of the notch. In order to better identify the optimum threshold for the paper being used, a paper characterization function is also available in the SETUP.

(10) **NOTE:** The “Notch distance” parameter represents the distance in mm from the upper margin of the ticket to the black mark on the ticket. For example, to set notch distance to 15 mm, modify the following parameters in order to obtain the desired values as indicated :

Notch Distance [mm x 10]:	1
Notch Distance [mm x 1]:	5
Notch Distance [mm x .1]:	0

The settings made are stored in EEPROM (nonvolative memory).
During power-up, if the LF LINE FEED is held down, the printer enters configuration mode and prints-out the setup report. It will remain in standby until a key is pressed or characters are received through the communication port (see Hexadecimal dump).
When the S1 or S2 keys are pressed, no function is executed.
When the LF LINE FEED key is pressed, the printer enters the parameter entry mode and follow the instructions displayed for the key functionality.

1.4 HEXADECIMAL DUMP

This function is used to diagnose the characters received through the communication port; the characters are printed out both as hexadecimal codes and ASCII codes.
Once the self-test routine has finished, the printer enters Hexadecimal Dump mode. The printer remains in standby until a key is pressed or characters are received through the communication port.
For every 8 characters received, the hexadecimal and corresponding ASCII codes are printed out (if the characters are underlined, the receive buffer is full). Shown below is an example of a Hexadecimal Dump:

HEXADECIAML DUMP

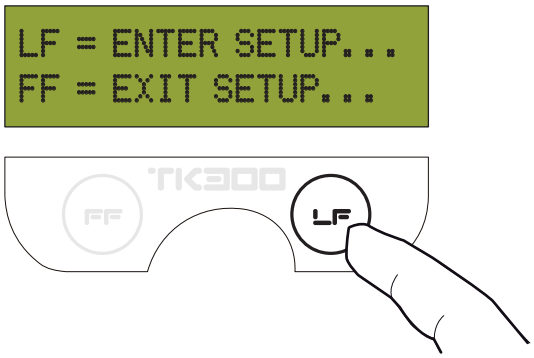
```
31 32 33 34 35 36 37 38     12345678
39 30 31 32 33 34 35 36     90123456
37 38 39 75 69 73 64 66     789uisdf
68 6B 6A 73 64 68 66 68     hkjsdhfh
73 64 66 6B 6A 68 73 64     sdfkjhsd
66 73 64 66 6B 68 6A 77     fsdfkhjw
65 69 6F 79 75 77 71 65     eioyuwqe
6F 72 69 75 77 65 72 69     oriuweri
6F 75 77 65 72 69 6F 75     ouweriou
77 65 72 69 6F 75 77 65     weriouwe
72 69 6F 75 77 65 72 68     riouwerh
6B 6C 73 64 66 68 6B 73     klsdfhks
64 66 6B 73 64 66 68 6A     dfksdfhj
73 64 66 6B 6A F2 73 64     sdfkj≥sd
66 6B F2 6A 73 68 64 66     fk≥jshdf
6A 6B 6C 68                 jklh
```

(Fig.1.3)

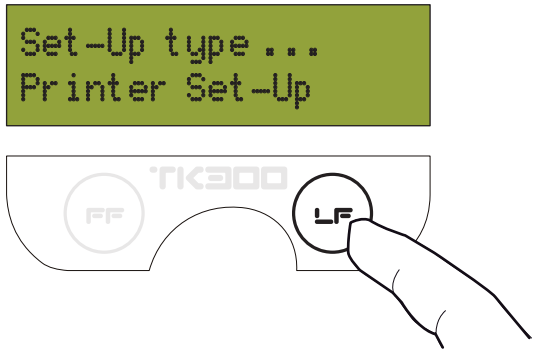
1.5 CALENDAR CLOCK

The printer is equipped with a Real Time Clock. During power-up, held down the LF LINE FEED key to enter in the printer configuration mode and prints-out the SETUP report.

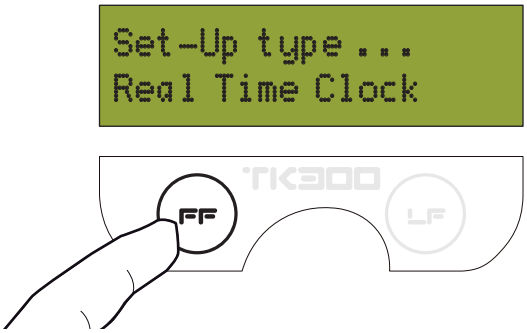
1. Press the LF LINE FEED key to enter in the clock configuration.



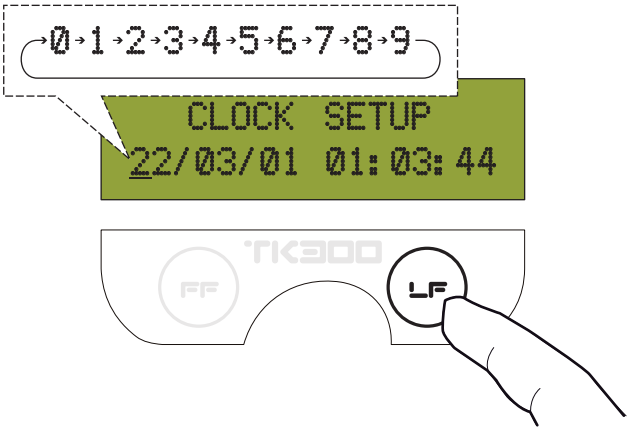
2. Press the LF LINE FEED key to select the Real Time Clock settings..



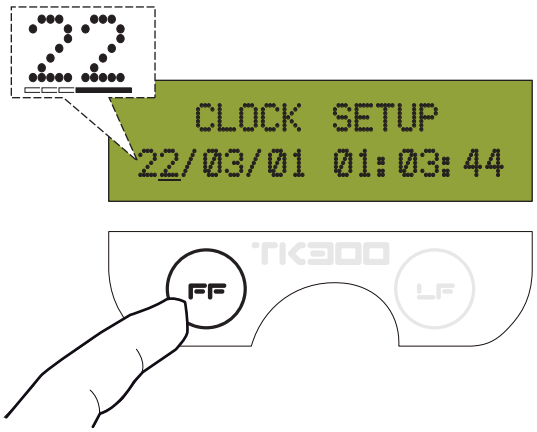
3. Press the FF FORM FEED key to confirm the selection. The date/time values will be displayed on the printer. Follow the instructions printed on the paper for the key functionality.



4. The highlighted digit indicates the digit to be modified. Press LF LINE FEED key to modify the value; every single LF LINE FEED key pressure increases of 1 his value. Once the max. selectionable value is reached the counting starts again from 0.



5. Press FORM FEED key to move the cursor on the next digit; if the cursor position is on the latest digit, press the FF FORM FEED key to exit and save the date/time entered. Then the printer is ready.



NOTE: Pressing S2 key to exit and terminate the setting procedure. The date/time displayed are saved and then the printer is ready.

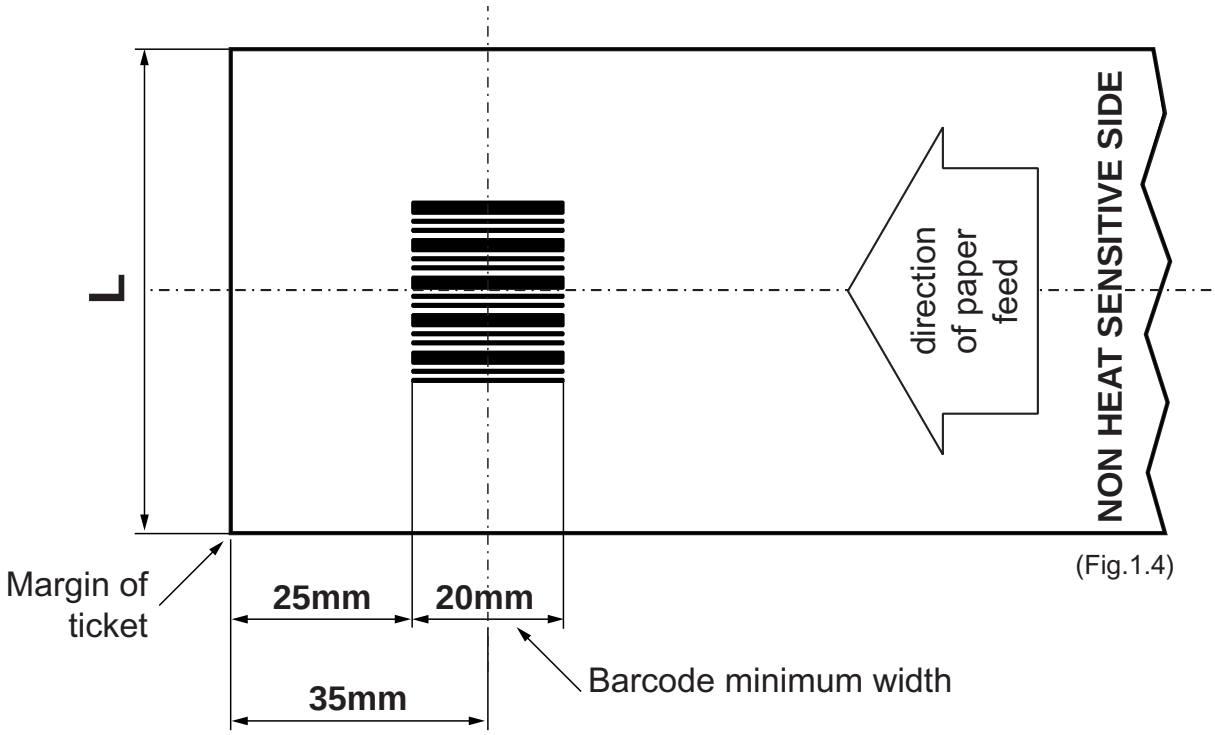
1.6 PAPER SPECIFICATIONS

TK300 prints on ticket width from 54 to 82.5 mm adjustable by the user; this printer manages both paper roll , fan-fold and ticket with notch.
The printer is available with optional barcode laser reader (CCD scanner) for reading pre-printed modules and optional RFID reader/writer (mifare/Icode)
The following paragraphs give the speci cations and dimensions for each ticket con guration.

1.6.1 Specifications for ticket with Barcode

Place the barcode on the non heat sensitive side of the ticket, 25 mm far from the margin to allow a correct reading when the ticket is aligned with the print (see Fig.1.4).

Dimensions in mm



(Fig.1.4)

where:

L : represent the paper width used (54¸ 82.5 mm).

NOTE
See the table 4.2 of chapter “4. Technical speci cations” for the main barcode speci cations (if the printer is equipped with the barcode reader).

1.6.2 Specifications for ticket with notch

The printer manages tickets with notch; place the notch on the heat sensitive side or on the non heat sensitive side of the ticket.

“Notch Position” parameter (see printer setup) set the positions for the notch as follow:

- Notch can be placed on heat sensitive side or NON sensitive side:

Heat sensitive side	--->	Notch position =	Up Side or
		Notch position =	Up Center
Non heat sensitive side	--->	Notch position =	Low Side or
		Notch position =	Low Center

- Notch can be placed in central or lateral position:

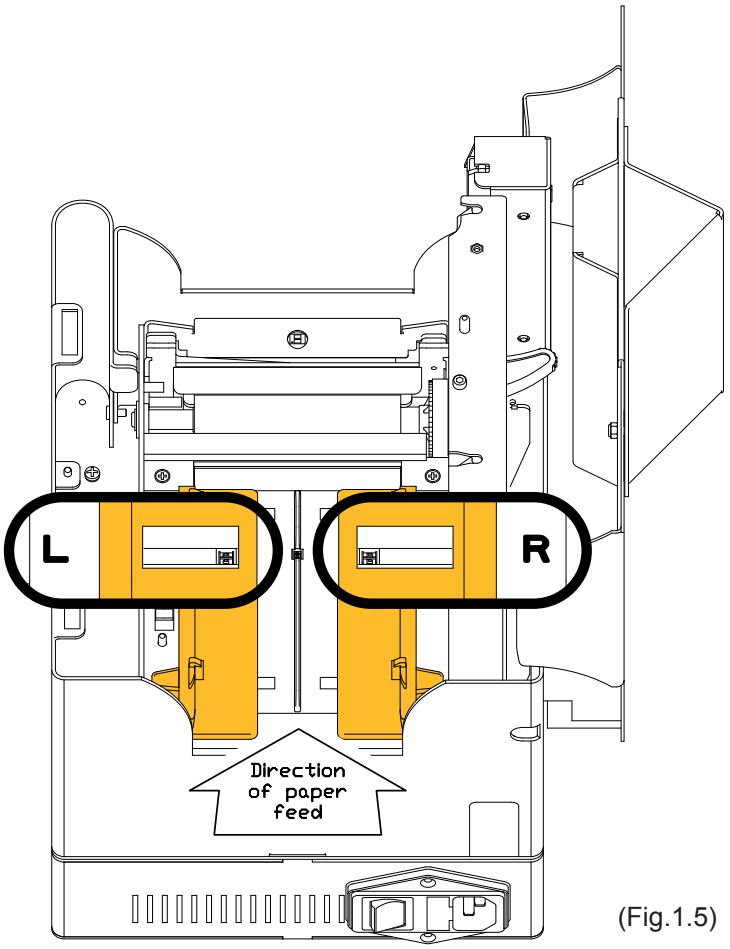
Lateral position	--->	Notch position =	Low Side or
		Notch position =	Up Side
Central position	--->	Notch position =	Low Center or
		Notch position =	Up Center

- The lateral sensor position depend on the sensor assembling position (sliding plan). The default position for the lateral sensor is the right side **R** (see Fig.1.5).

NOTE
The central sensor is always mounted.
The Left lateral sensor or the right lateral sensor is mounted depending on the printer model (see Fig.1.5).

where

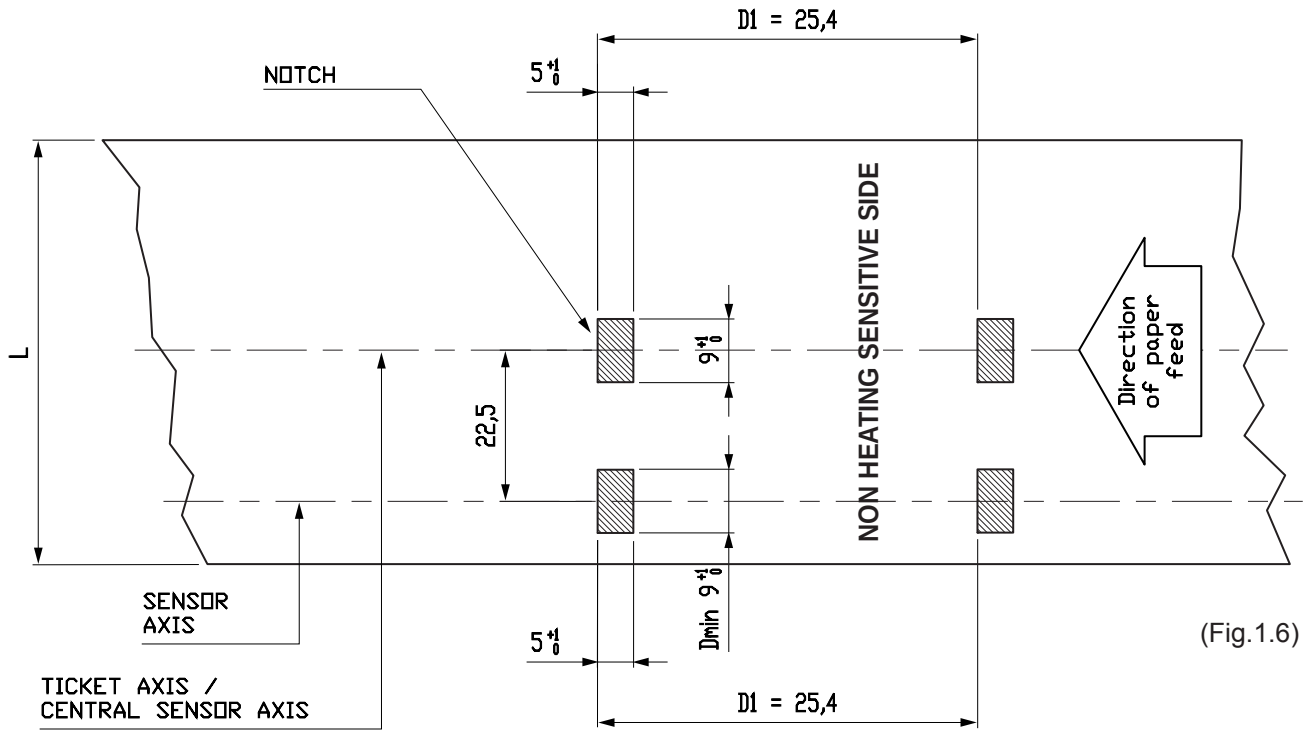
L : left lateral sensor
R: right lateral sensor



(Fig.1.5)

Fig. 1.6 show an example of paper roll with notch on the non heating sensitive side (non printable side); lateral notch on the right side.

Dimensions in mm



(Fig.1.6)

where :

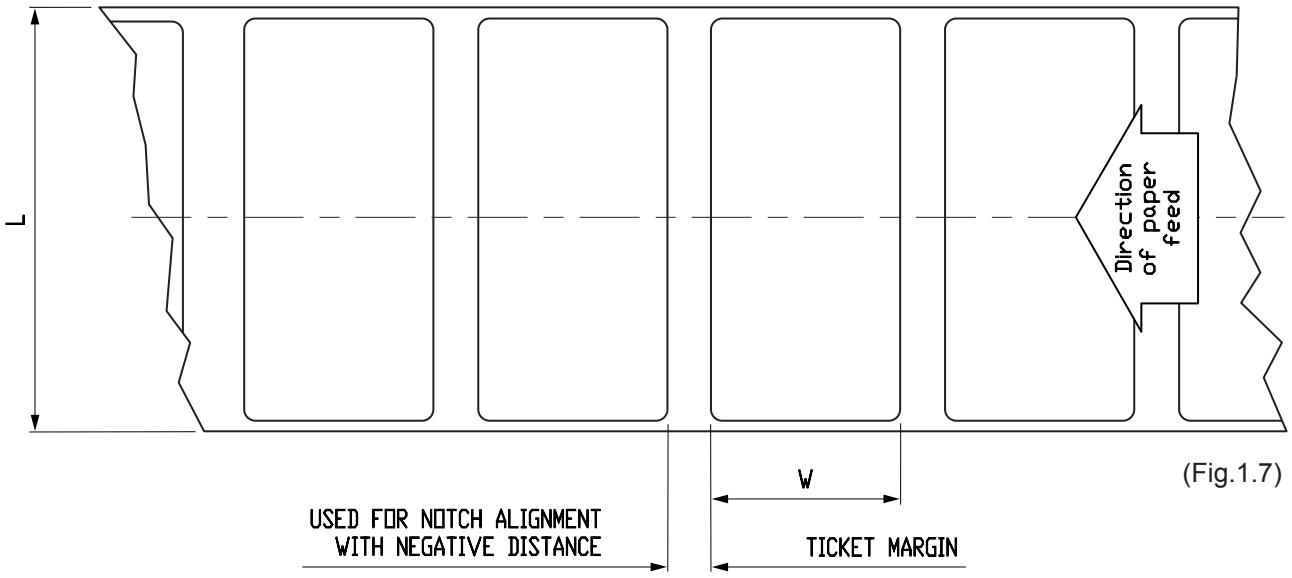
L : represent the paper width used (54 ÷ 82.5 mm);
Dmin : indicate the minimum notch dimensions;
D1 := indicate minimum notch to notch distance.

NOTA
If the notch was on the heat sensitive side the image on the paper (Fig.1.6) would be mirrored on the paper axis.

- The printer automatically choice the sensor used to detect the paper presence according to the selected notch sensor. For example, if the setting for the “Notch position” parameter is “Low side”, “High center” is used to detect the paper presence.

- for a correct alignment, the notch distance from the margin must be between -5 and 66 mm (notch sensor/print head distance).

- If the notch position from the margin is negative, the notch is outside the printable ticket. For example the printing on paper with labels (see Fig.1.7).



(Fig.1.7)

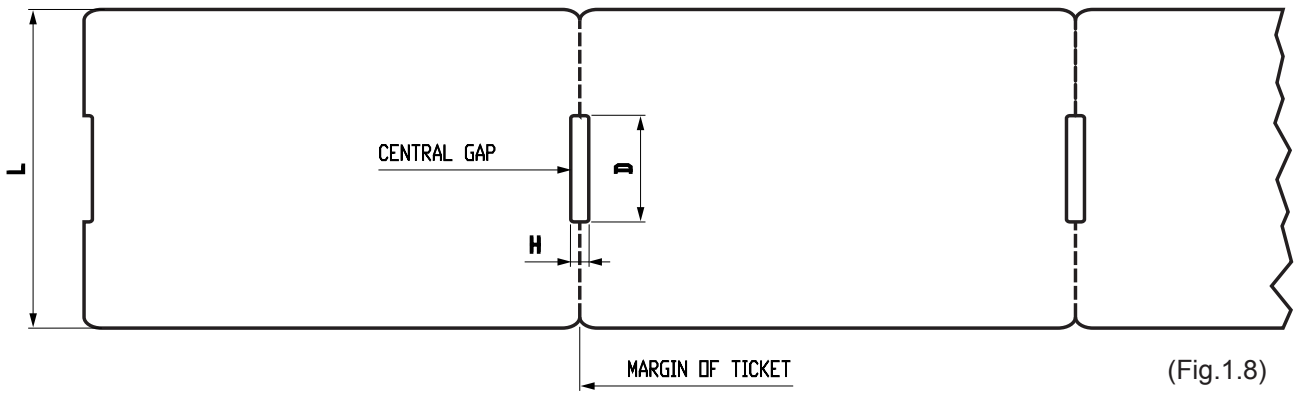
where:

L : represent the paper width used (54 ÷ 82.5 mm);
W : indicate the minimum managed length 25.4 mm (1”).

- With TK300 is possible to print label; the minimum length is 25.4 mm (1”).

1.6.3 Specifications for ticket with gap

The printer manages tickets with gap (central or lateral gap). Set the “Notch position” with “Transparent Center” or “Transparent side” value for print/cut. Fig.1.8 shows an example for credit card size ticket (84x54 mm) with central gap.



(Fig.1.8)

where:

L : represent the paper width used (54 ÷ 82.5 mm);
H : indicate the managed minimum height (2 mm).
D : indicate the minimum width (10 mm).

1.6.4 Specifications for ticket with RFID Tag

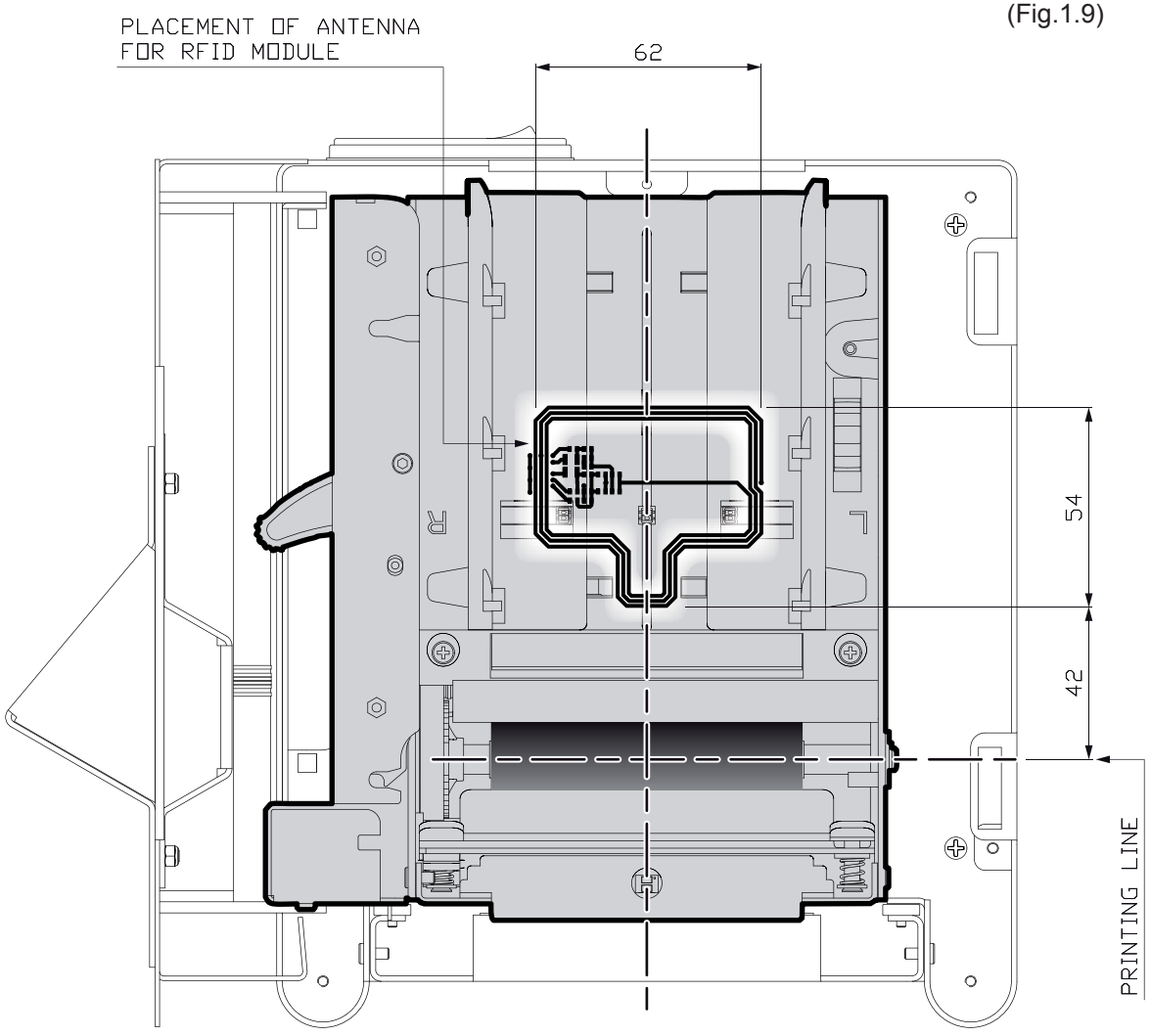
The printer manages ticket with RFID Tag. RFID (acronym for Radio Frequency IDentification) is a technology to identify automatically items using radio waves; this system is based on wireless data capture from RFID tag using appropriate readers. The RFID tag, or transponder, is made up of:

- the microchip that stores the data (including also a unique serial number written);
- an RFID antenna.

On the RFID printer model, under the paper guide (see Fig. 1.9), an RFID transceiver module is mounted, provided with antenna, that allows to send and receive RF data to and from the tag. For this application the ticket dimensions are not binding but for good reading is important that the tag inside the ticket, after alignment, intersects the antenna area. The Fig.1.9 shows the antenna's area and its position under the paper guide in the RFID printer model

NOTE
Using ticket with RFID tag, the minimum managed length is a credit card size ticket (84x54 mm).

(Fig.1.9)



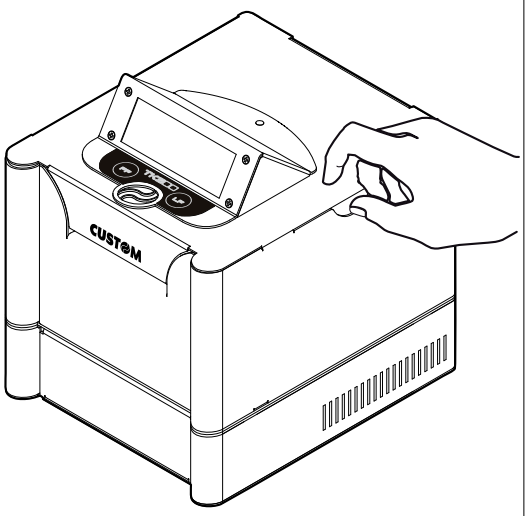
1.7 MAINTENANCE

1.7.1 Changing paper roll

Each time you change the paper, check the inside of the printer.

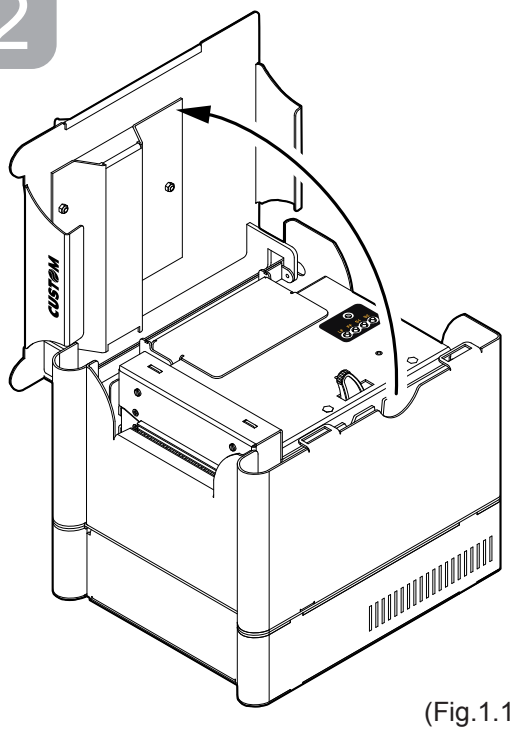
- Open the printer cover as shown (See Fig.1.10 and Fig.1.11).
- While pushing the opening lever as shown, lift the head/cutter unit (see Fig.1.12 and Fig.1.13) until it locks into position.

1



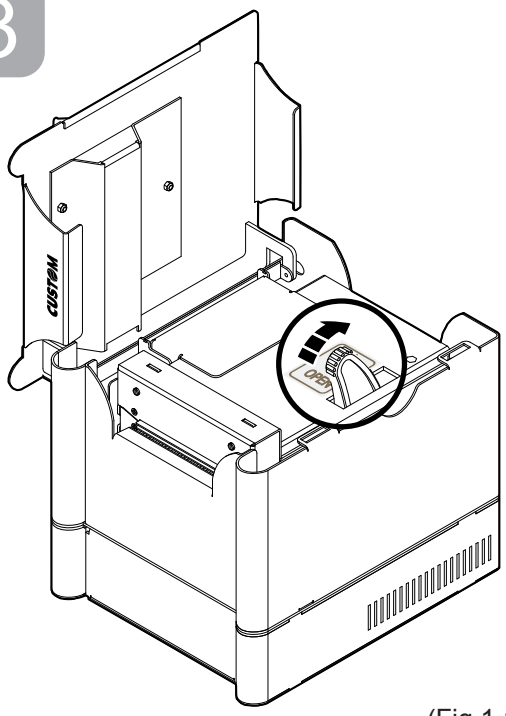
(Fig.1.10)

2



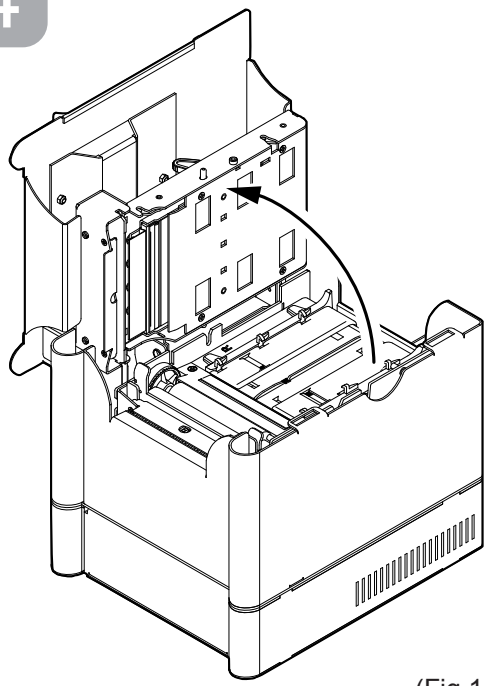
(Fig.1.11)

3



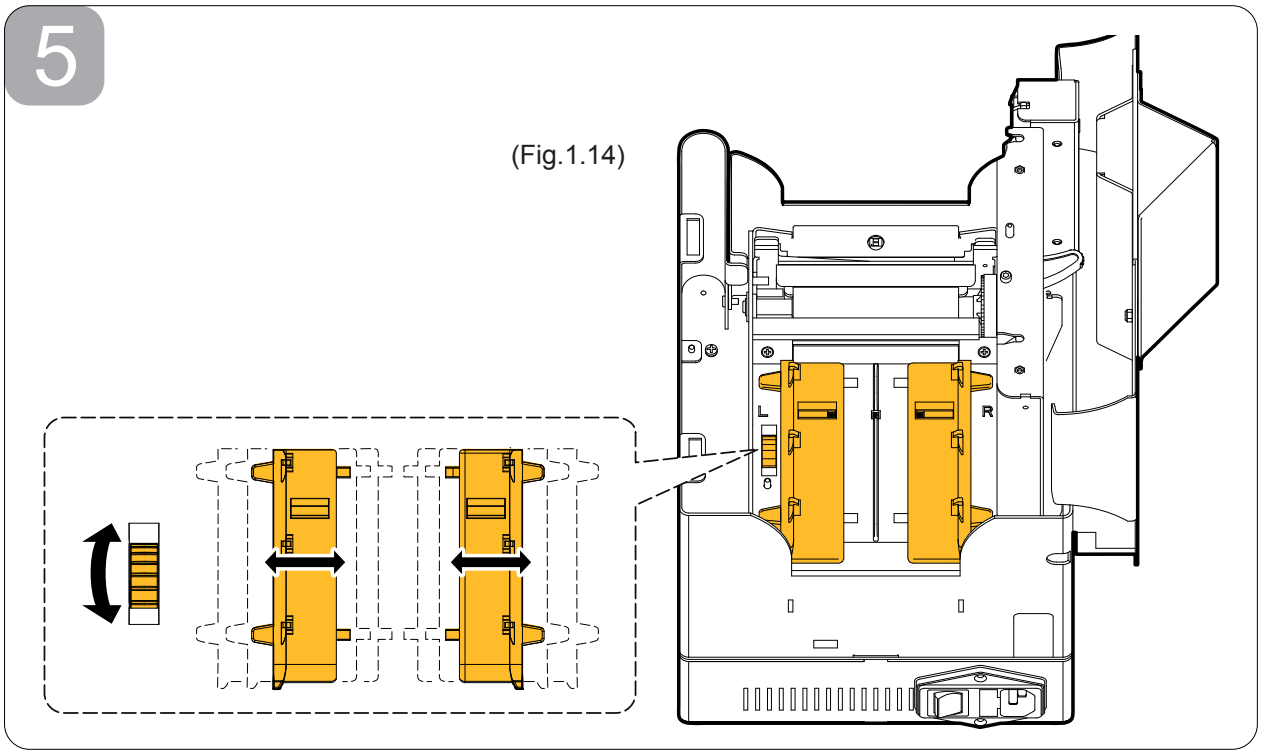
(Fig.1.12)

4



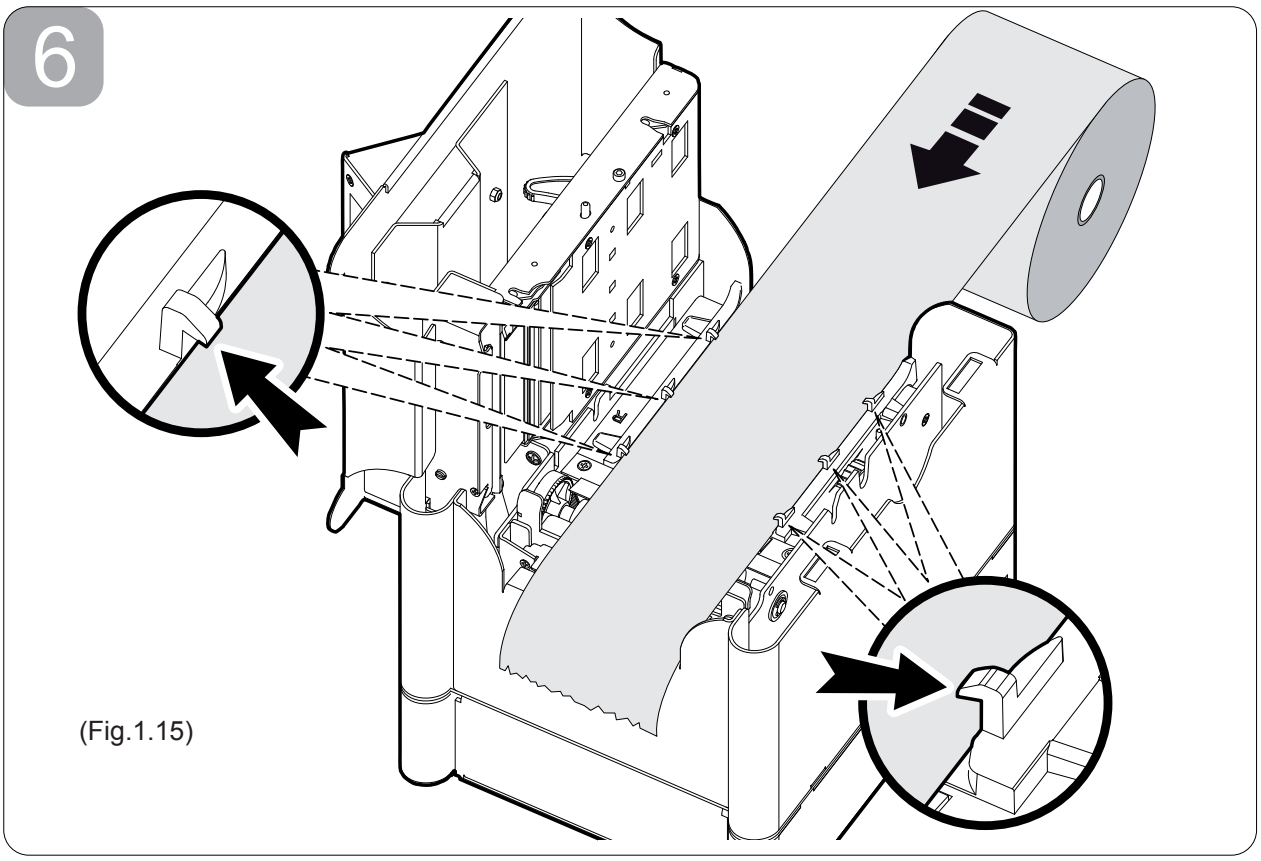
(Fig.1.13)

- Using the wheel, as shown in figures 1.14, to regulate the width of the paper guide in according to type of paper used.



(Fig.1.14)

- Position the paper roll, so that it unrolls correctly and be careful that the paper must be positioned inside the hook of the paper guide; make sure the paper come out a few centimetres outside of the paper mouth.

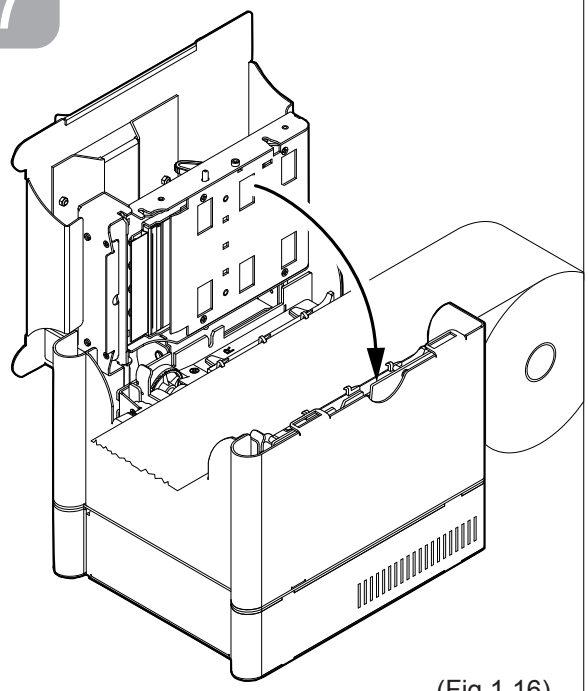


(Fig.1.15)

- Lower the head/cutter unit.
- Push on the head/cutter unit to lock it. Wait for the paper to load automatically.
- Lower the printer cover

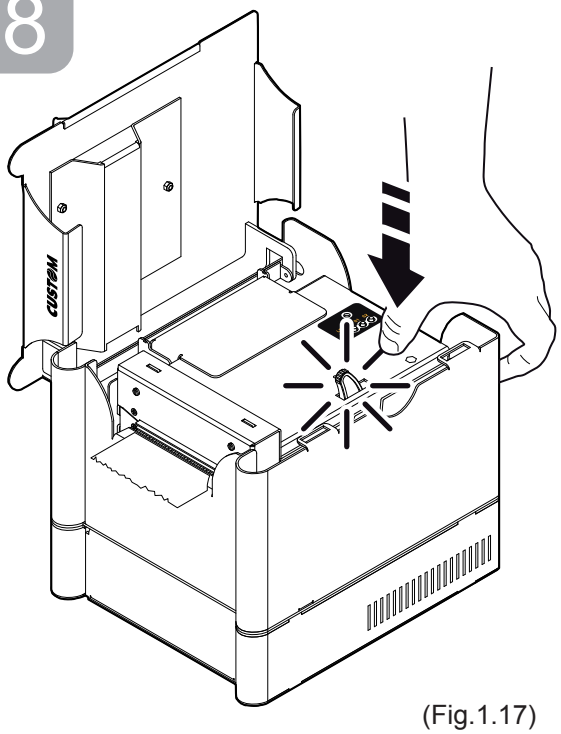
WARNING:
Respect the steps shown in figures.
Is forbidden to lower the head/cutter unit using the printer cover.

7



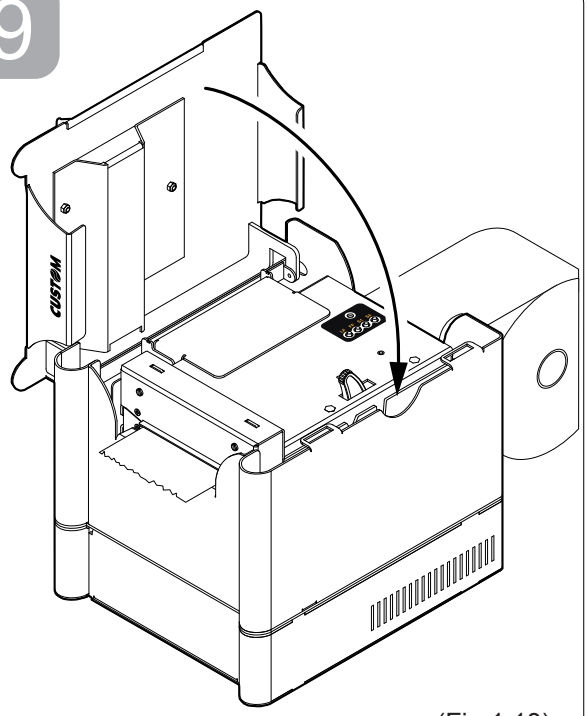
(Fig.1.16)

8



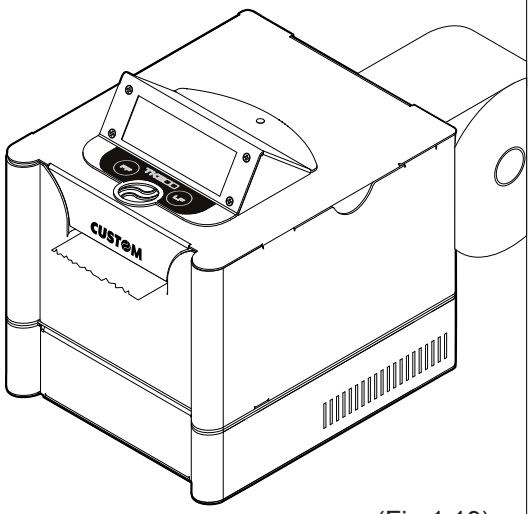
(Fig.1.17)

9



(Fig.1.18)

10

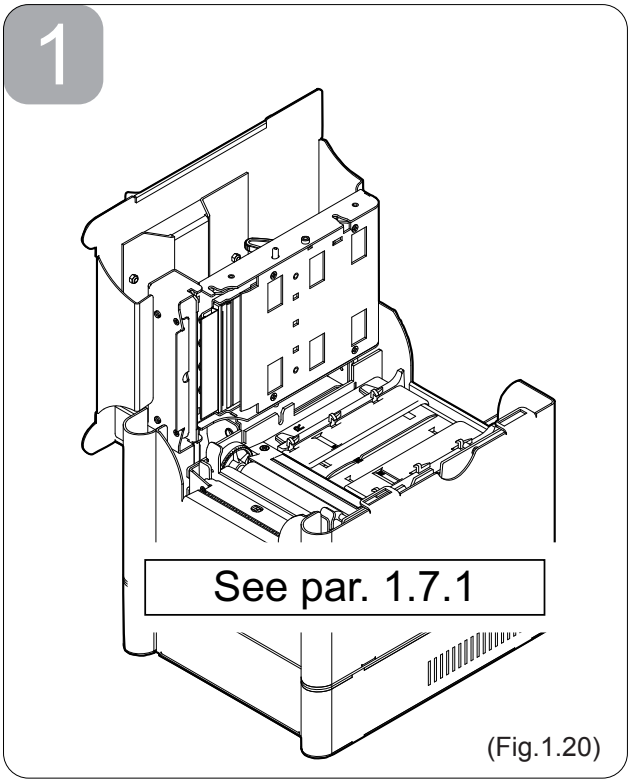


(Fig.1.19)

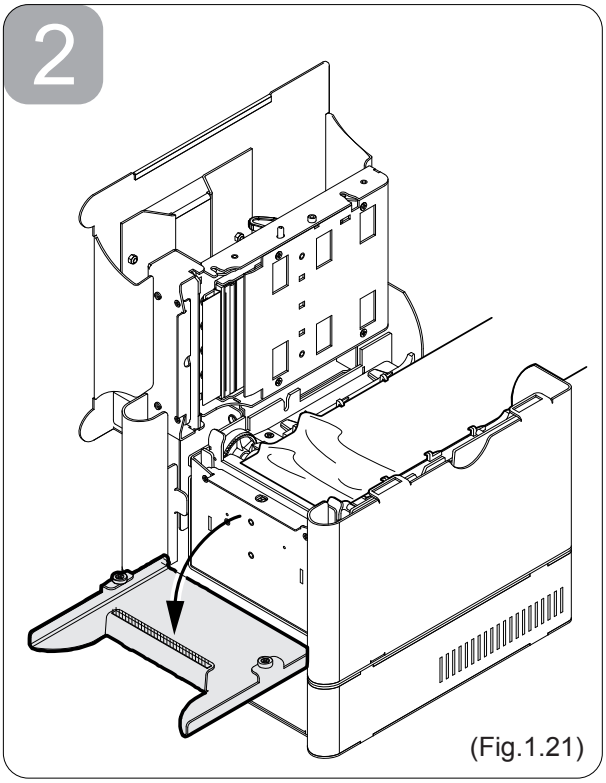
1.7.2 Paper Jam

In case of paper jam proceed as follow:

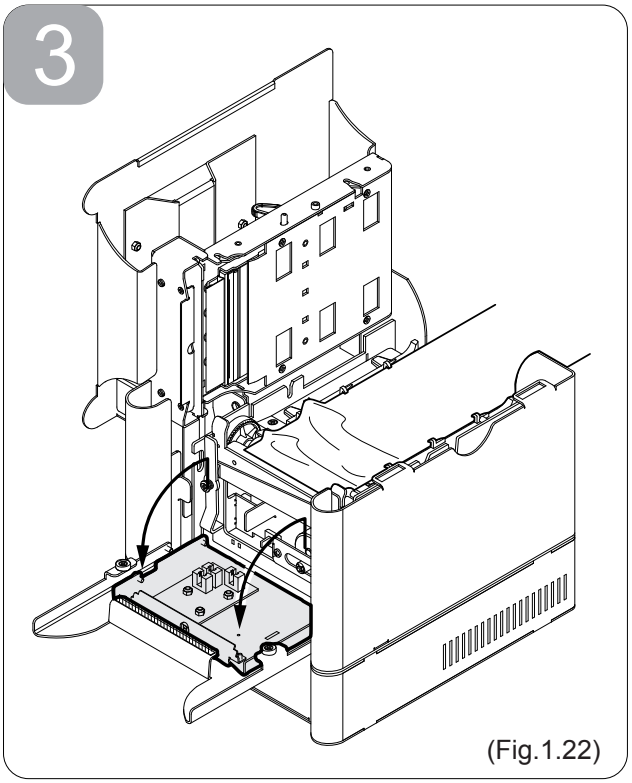
- Open the printer cover following instructions of par. 1.7.1.
- Lower the front cover as shown (Fig. 1.21).
- Unlock the cutter cover (see Fig. 1.22).
- Remove the damaged paper and replace it with a new one.
- Check for scraps of paper in the printer and in that case remove it.



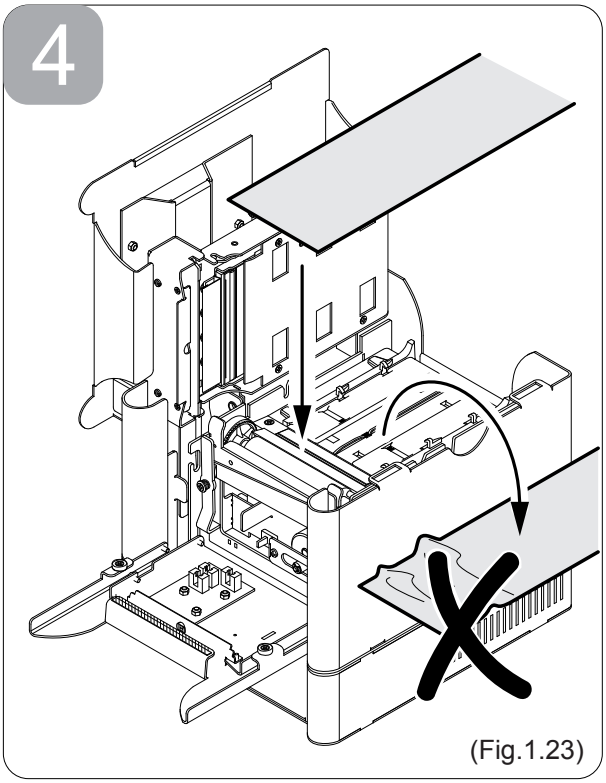
(Fig.1.20)



(Fig.1.21)



(Fig.1.22)

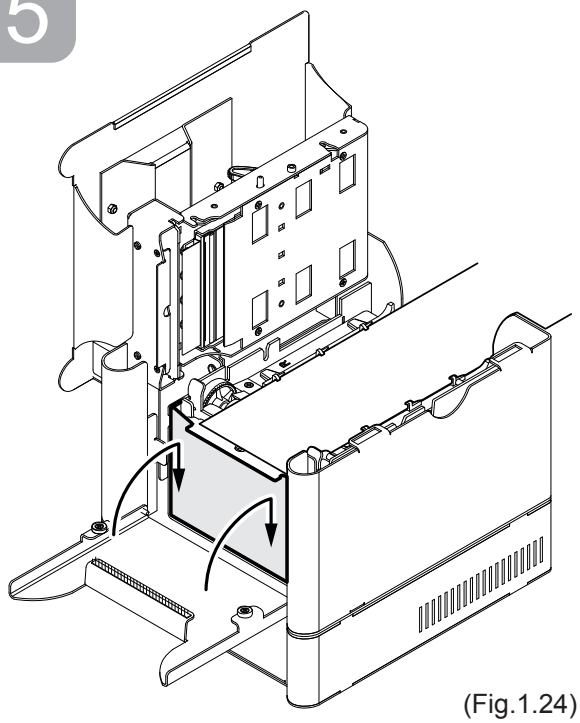


(Fig.1.23)

- Lock the cutter cover (see Fig. 1.24).
- Close the front cover as shown (Fig. 1.25).
- Close the printer cover following instructions of par. 1.7.1.

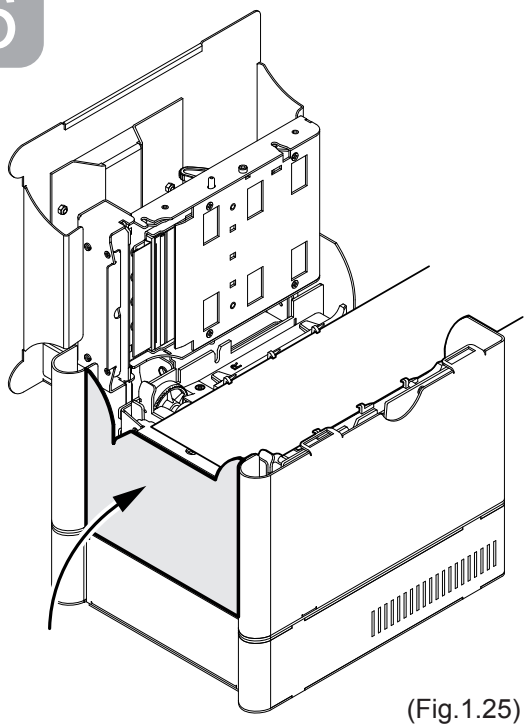
WARNING:
Respect the steps shown in figures.
Is forbidden to lower the head/cutter unit using the printer cover.

5



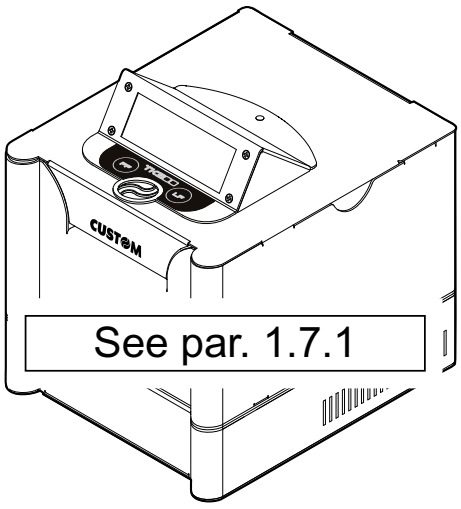
(Fig.1.24)

6



(Fig.1.25)

7



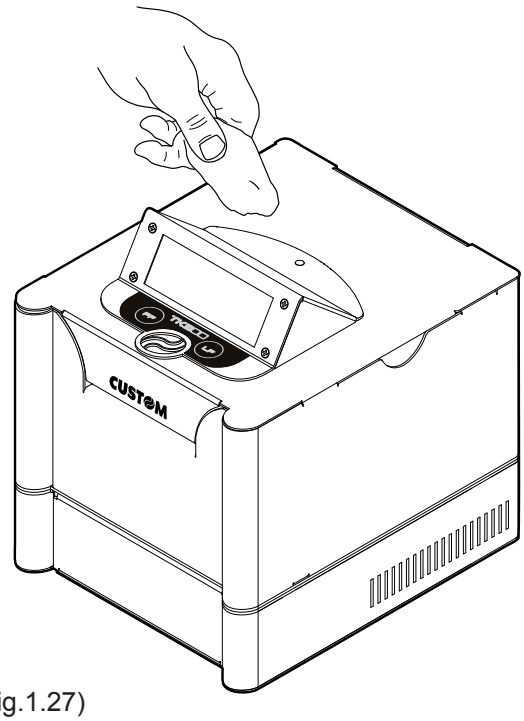
(Fig.1.26)

1.8 CLEANING

BEWARE !
Before cleaning the front door turn the power off using the suitable switch and remove the mains plug from the wall socket.

ATTENTION!
Do not touch the head heating line with bare hands or metal objects. Do not perform any operation inside the printer immediately after printing because the head and motor tend to become very hot.

OUTSIDE CLEANING

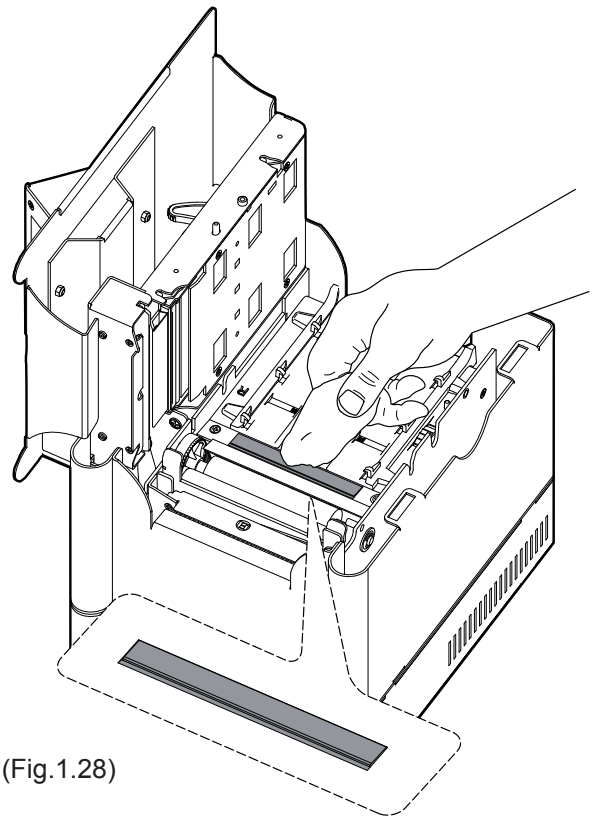


(Fig.1.27)

To clean the machine, use a pneumatics air or soft cloth.

- First remove the mains plug from the wall socket.
- Do not use alcohol, solvents, or hard brushes.
- Do not let water or other liquids get inside the machine.

CLEANING THE BARCODE READING

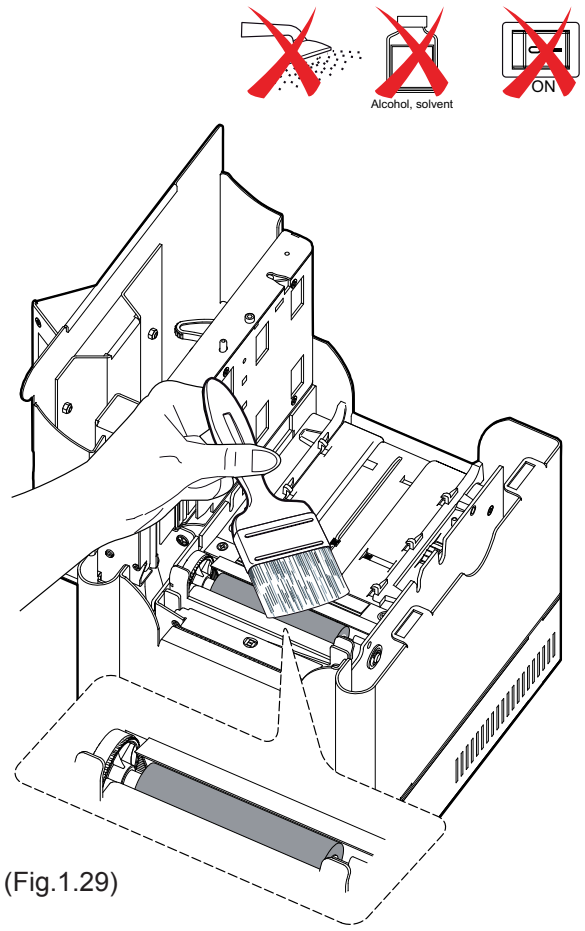


(Fig.1.28)

To clean the plastic window for barcode reading, wipe the glass surface gently with a clean cloth. The glass surface should be wiped very carefully.

- First remove the mains plug from the wall socket.
- Do not use alcohol, solvents, or hard brushes.
- Do not let water or other liquids get inside the machine.

CLEANING THE ROLLER

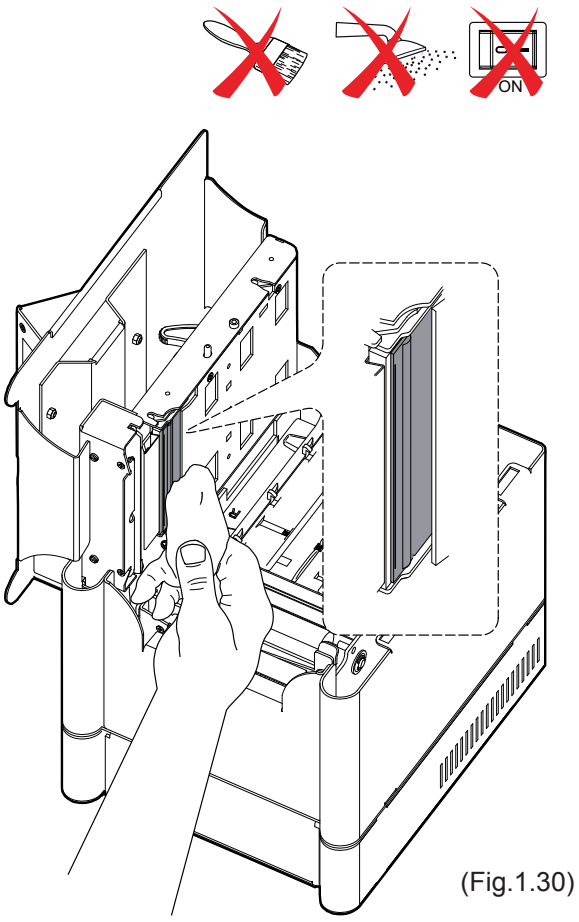


(Fig.1.29)

To clean the roller, use a a medium-stiff brush to avoid them being scratched.

- First remove the mains plug from the wall socket.
- Do not use alcohol or solvents.
- Do not let water or other liquids get inside the machine.

CLEANING THE PRINTING HEAD



(Fig.1.30)

Clean the printing head heating line using a non-abrasive cloth moistened with denatured alcohol.

- First remove the mains plug from the wall socket.
- Do not use solvents or hard brushes.
- Do not let water or other liquids get inside the machine.

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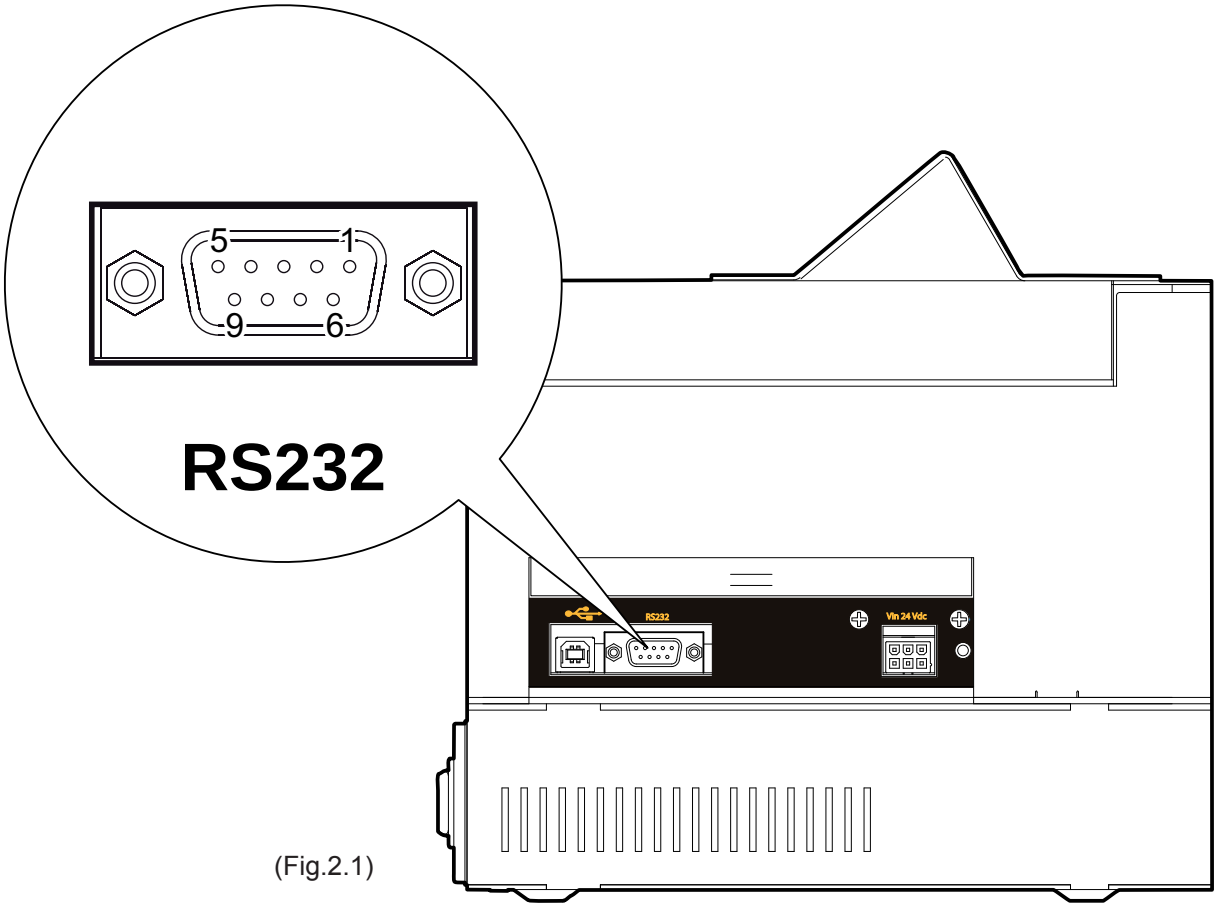
2.1 RS232 SERIAL



(Fig.2.1)

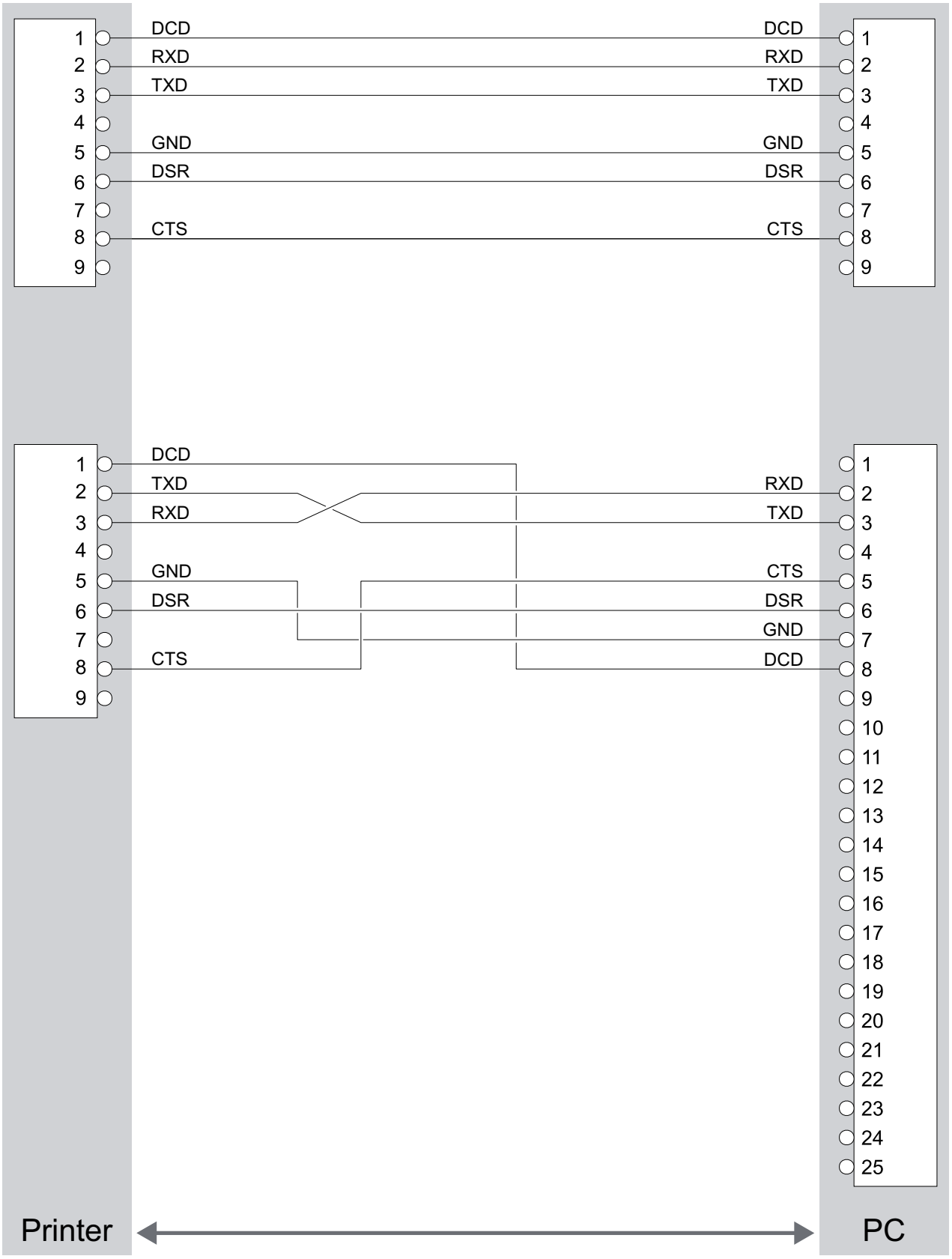
The printer has an RS232 interface with 9-pin female connector (see Tab.2.1). Refer to the table below for the connector pin signals:

(Tab.2.1)

PIN	SIGNAL	IN/OUT	HOST	DESCRIPTION
1	DCD	OUT	DCD	Individuation Data Carrier. Printer on (active with RS232 level high)
2	TXD	OUT	RXD	Receive data. Serial output (from the host)
3	RXD	IN	TXD	Trasmit data. Serial data input (to the host)
4	N.C.	-	N.C.	Not connected
5	GND	-	GND	Signal Ground
6	DSR	OUT	DSR	Ready to send. Printer on and operational (active with RS232 level high)
7	N.C.	-	N.C.	Not connected
8	RTS	OUT	CTS	Ready to send. Ready to receive data (active with RS232 level high)
9	N.C.	-	N.C.	Not connected

The diagrams below illustrate a sample connection between the printer and PC using a 25- or 9-pin female connector.

(Fig.2.2)



2.2 USB SERIAL INTERFACE

Printers with USB serial interface conform to USB 1.1 standards and have the following specifications:

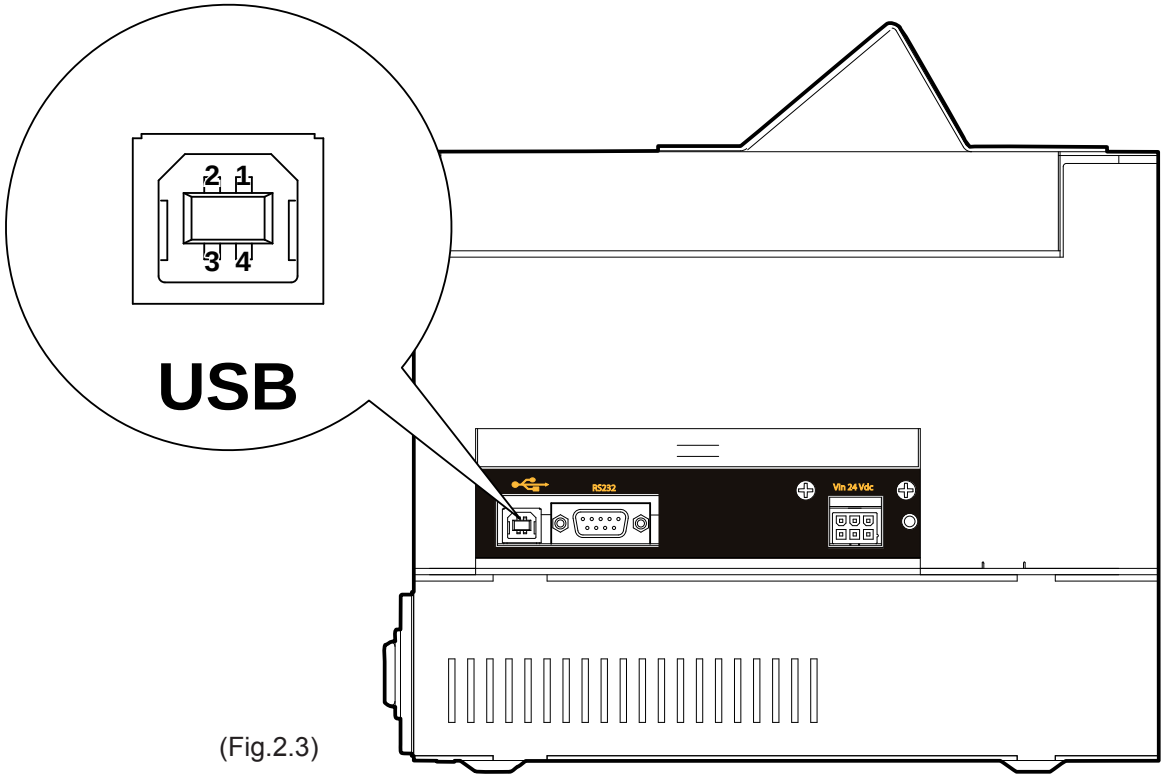
- Communication speed 12 Mbit/sec
- “Receptacle series B” - type connector.

Refer to the table below for the connector pin signals and connection to a device:

(Tab.2.2)

PIN	SIGNAL	DESCRIPTION
1	VBUS	N.C.
2	D-	Data -
3	D+	Data +
4	GND	Signal ground
Shell	Shield	Cable shield

Fig. 2.3 illustrates USB interface connector pin layout:



(Fig.2.3)

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3.1 TECHNICAL SPECIFICATIONS

Table 3.1 gives the main technical specifications for the printer.

(Tab.3.1)

Available interfaces	USB	RS232	
Baud rate	None	From 1200 to 115.200 bps	
Sensors	Ticket presence, Notch, Paper presence on output, head temperature, cover open, cutter cover open, external near paper end		
Printing driver	Window™ 2K, XP, LINUX		
Receive buffer	64 Kbytes		
Flash memory	16 Mbytes		
Emulation	ESC/POS™, SVELTA		
PRINTER SPECIFICATIONS			
Print method	Thermal, fixed head		
Resolution	203 DPI (8 dot/mm) / Enhanced quality head		
Printing mode	Straight, 90°, 180°, 270°		
Printing format	Height/Width from 1 to 8, bold, reverse, underlined, italic		
Character fonts	PC437, PC850, PC860, PC 863, PC865, PC858 (euro) SVELTA emulation: 20 fonts		
Graphics memory	Logos dynamic management (max 2 MB graphics memory)		
Printing speed			
High Quality	120 mm/sec.		
Normal	200 mm/sec.		
High Speed	250 mm/sec.		
Print head reliability	50 Km		
Cutter reliability	1.000.000 with paper > 200 g/m^2 1.500.000 with paper < 200 g/m^2		
Character set	3		
Character density	**11 cpi**	**15 cpi**	**20 cpi**
Number of columns	35	45	64
Characters (L x H mm)	2,25 x 3	1,75 x 3	1,25 x 3
PAPER SPECIFICATIONS			
Type of paper	Thermal rolls (heat-sensitive side on outside of roll) Fan- fold thermal paper with notch		
Paper width	from 54mm to 82.5mm (2mm step)		
Recommended types of paper	from 70 g/m^2 to 255 g/m^2		
Internal roll core diameter	≥ 25mm		
Core type	Cardboard or plastic		
ELECTRICAL SPECIFICATIONS			
Power Supply	220 Vac ±10%		
Medium consumption ***(50% Dot ON)***	3.5 A		

ENVIRONMENTAL CONDITIONS	
Operating temperature	0-50°C
Relative humidity	10-85% Rh
Storage temperature / Humidity	-20 °C – 70 °C / 10% - 90% Rh
Dimensions	Length [mm] = 200
	Width [mm] = 240
	Height [mm] = 237 *(with cover closed)* 346 *(with cover open)*
Weight [gr]	3700

Table 3.2 gives the main technical specifications for the barcode reader in the equipped printer model.

(Tab.3.2)

Electrical Characteristics	
Scan rate	270 scans/sec
Optical Characteristics	
Sensor	Liner CCD Sensor
Light Source	Red Leds, 639 nm
Ambient Light	1500 LUX MAX (Fluorescent lamp)
Performance	
Resolution	5 mil. (0.127 mm)
Readable Barcode	ALL UPC/EAN/JAN , Code 39, Code 39 Full ASCII, Code 128,Code 93, Interleave 25, Industrial 25, Matrix 25, China Postage, CODABAR/NW7, Code 11, MSI/PLESSEY, Code 32.

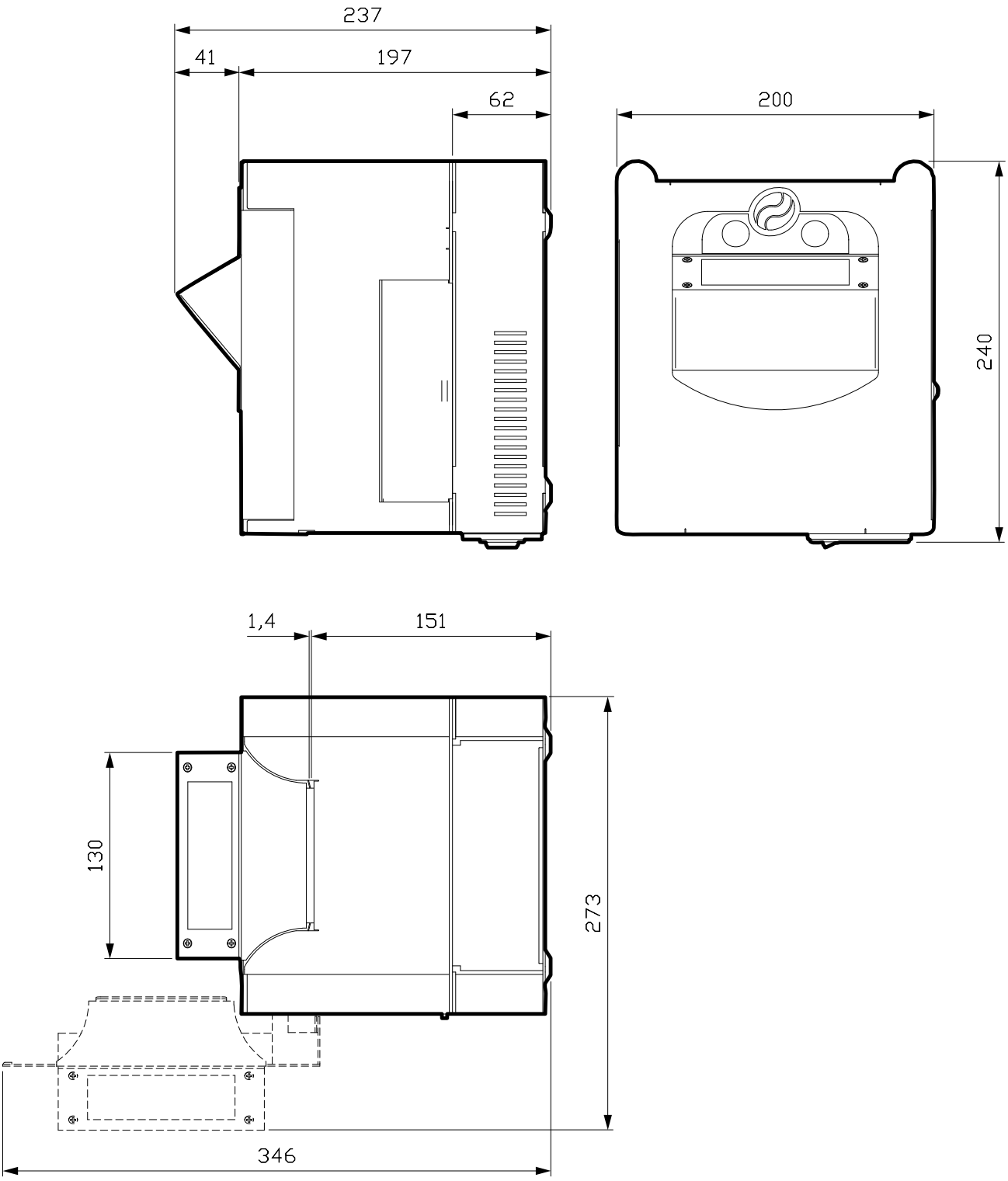
Table 3.3 gives the transponder specifications for the printer model with RFID Reader/writer (mifare/icode).

(Tab.3.3)

Supported transponders:
ISO159693 (icode)
ISO1443-MIFARE® (MIFARE Ultralight, MIFARE 1K, MIFARE 4K)

3.2 DIMENSIONS

In the following figures shows the dimensions of the printer.



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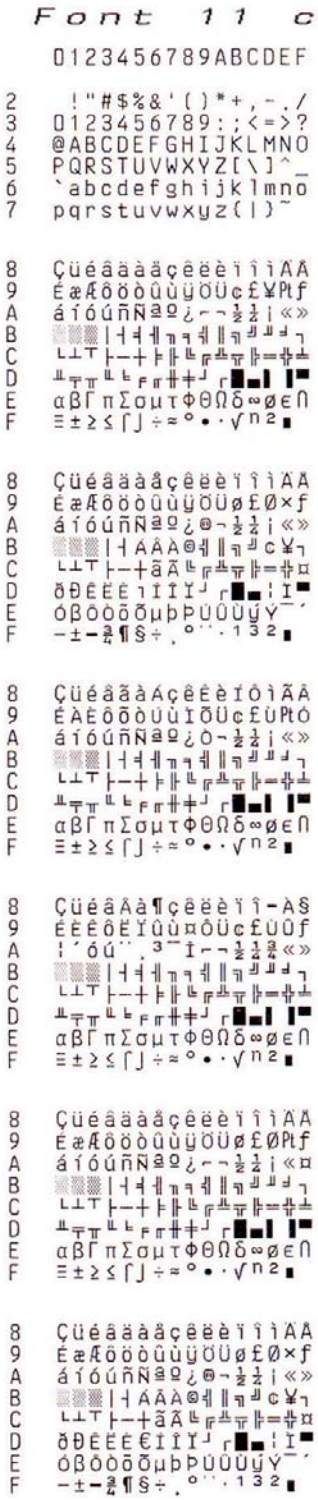
4.1 CHARACTER SETS

The printer has 3 fonts of varying width (11, 15 and 20 cpi) which may be accessed through programming (section 1.2) or control characters. Each of these fonts offers the following code tables: PC437, PC850, PC860, PC863, PC865, PC858.
Shown below in figures 4.1 are examples of the 11 cpi character set.

(Fig.4.1)



PC437
(Usa,Standard,Europe)

PC850
(Multilingual)

PC860
(Portuguese)

PC863
(Canadian-French)

PC865
(Nordic)

PC858
(Euro symbol)

To print the Euro (€) symbol, the command sequence is: $1B, $74, $13, $D5.

4.2 CHARACTER SETS IN SVELTA EMULATION

In SVELTA emulation the printer has 20 fonts of varying width which may be accessed through control characters. The following list shows the font available and relative dimensions in dot:

· Font HEL8PT8 (A)	Proportional Font with fixed height (H = 28 dot)
· Font HEL10PT8 (A)	Proportional Font with fixed height (H = 34 dot)
· Font HEL14PT8 (A)	Proportional Font with fixed height (H = 50 dot)
· Font HEL16PT8 (A)	Proportional Font with fixed height (H = 55 dot)
· Font 18x24	(Font 18x24 in ESC/POS emulation)
· Font 14x24	(Font 14x24 in ESC/POS emulation)
· Font 10x24	(Font 10x24 in ESC/POS emulation)
· Font 8x12 (B)	Fixed Font
· Font 8x12-2 (B)	Fixed Font
· Font 12x12 (B)	Fixed Font
· Font 14x11 (B)	Fixed Font
· Font 16x24 (B)	Fixed Font
· Font 16x24_1 (B) (C)	Fixed Font
· Font 16x24_2 (B) (C)	Fixed Font
· Font 20x15 (B)	Fixed Font
· Font 28x20 (B)	Fixed Font
· Font 14x24_1 (B) (C)	Fixed Font
· Font 16x24CN (B) (C)	Fixed Font
· Font OCRB (20x32) (B)	Fixed Font

For further informations to characters representations print directly the Font Test (D).

(A) NOTE:
A proportional font is a font in which different characters have different pitches (widths).

(B) NOTE:
A fixed font is the opposite of a proportional font and is a fixed-pitch font.

(C) NOTE:
The fonts with the same name and dimension contain different characters in different positions from theirs.

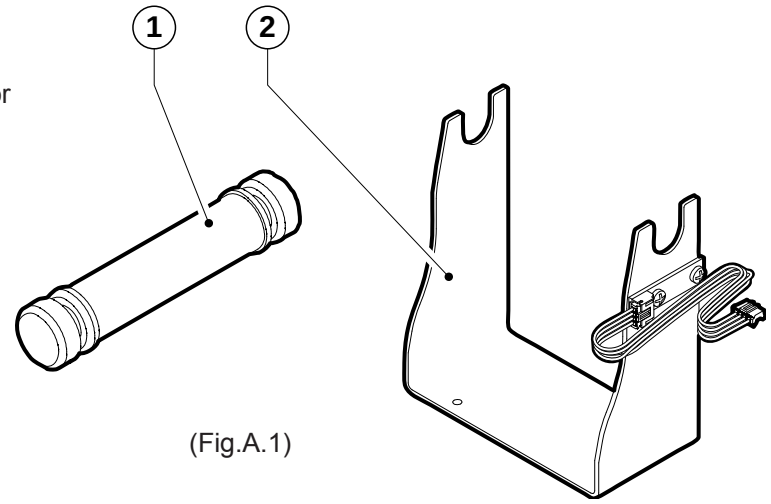
(D) NOTE:
During power-up, if the FORM FEED (FF) key is held down, the printer executes the FONT TEST.

A.1 ACCESSORIES

A.1.1 Paper roll stand

PCXSP-KPM300	Paper roll stand kit with sensor

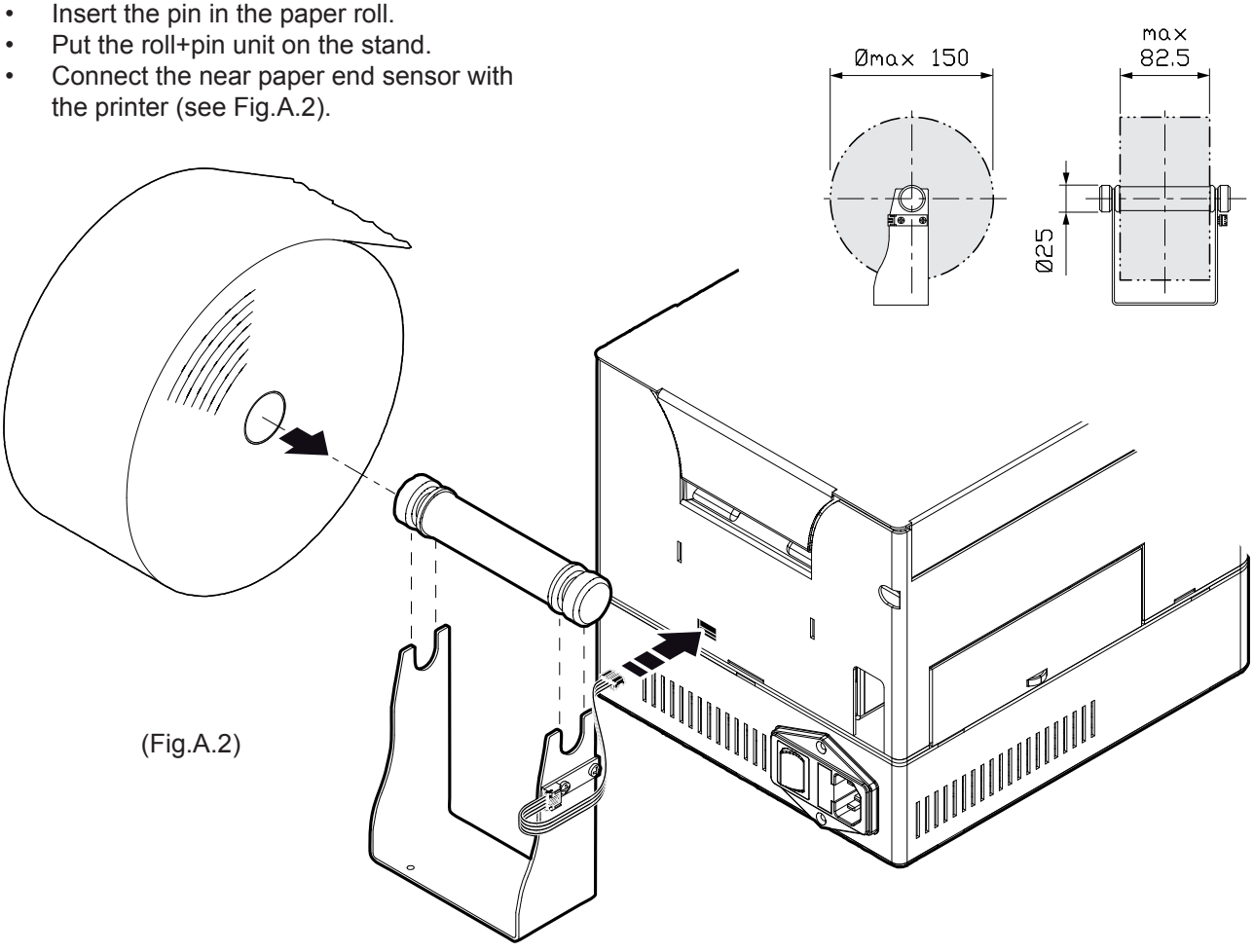
The kit includes (see Fig.A.1):
1 Pin
2 Stand complete of near paper end sensor



(Fig.A.1)

Assembly instructions

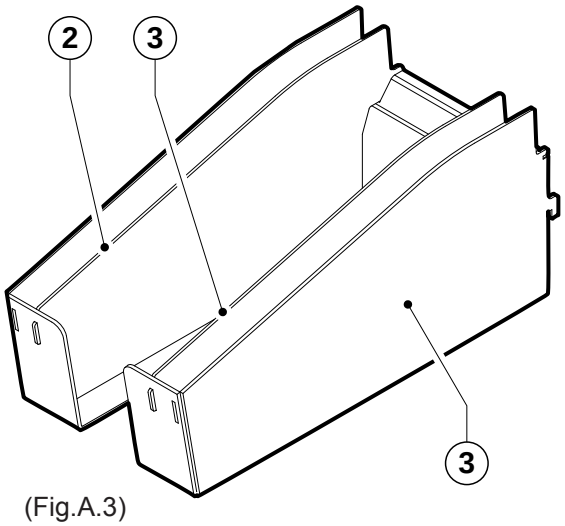
- Insert the pin in the paper roll.
- Put the roll+pin unit on the stand.
- Connect the near paper end sensor with the printer (see Fig.A.2).



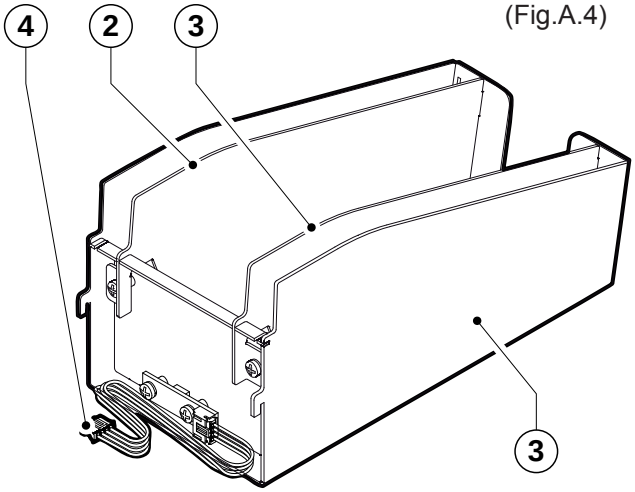
(Fig.A.2)

A.1.2 FanFold Holder

PCXSP-KPM300-FF	FanFold Holder
PCXSP-KPM300-FF-QFC	FanFold Holder with near paper end sensor



(Fig.A.3)



(Fig.A.4)

The kit PCXSP-KPM300-FF includes (see fig. A.3):

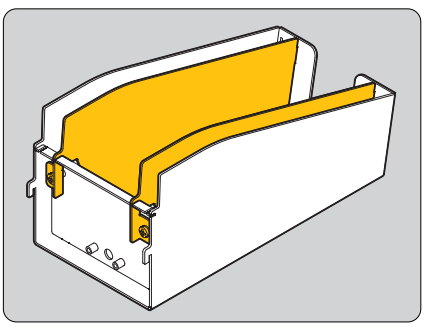
1 FanFold slot
2 Left internal width adjustment plate
3 Right internal width adjustment plate

The kit PCXSP-KPM300-FF-QFC includes (see fig. A.4):

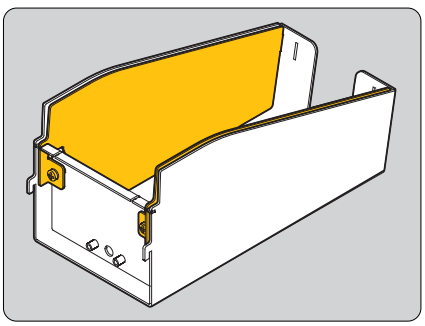
1 FanFold slot
2 Left internal width adjustment plate
3 Right internal width adjustment plate
4 Near paper end sensor wiring

Paper instructions

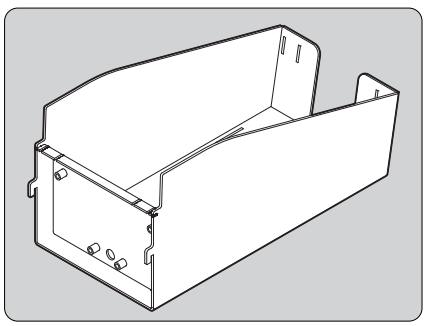
Before load the paper, position the internal width adjustment plates, (right and left), in the appropriate plate in relation to ticket width used (see following figures):



0 ÷ 54 mm



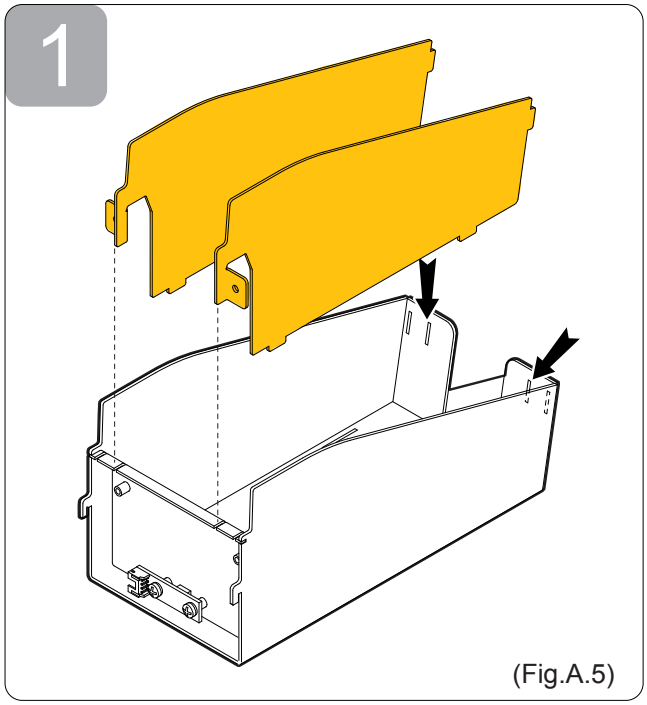
54 ÷ 72 mm



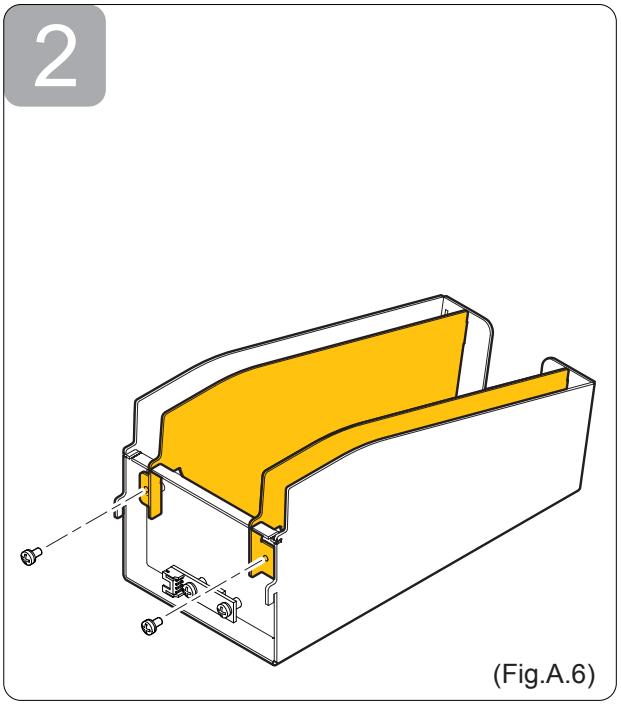
72 ÷ 82.5 mm

Using FanFold holder with paper 0 ÷ 54 mm:

- Insert the internal width adjustment plates with the right orientation using the fixing holes indicated from the arrows (see Fig.A5).
- Unscrew the two screw located on the back (see fig. A.6)



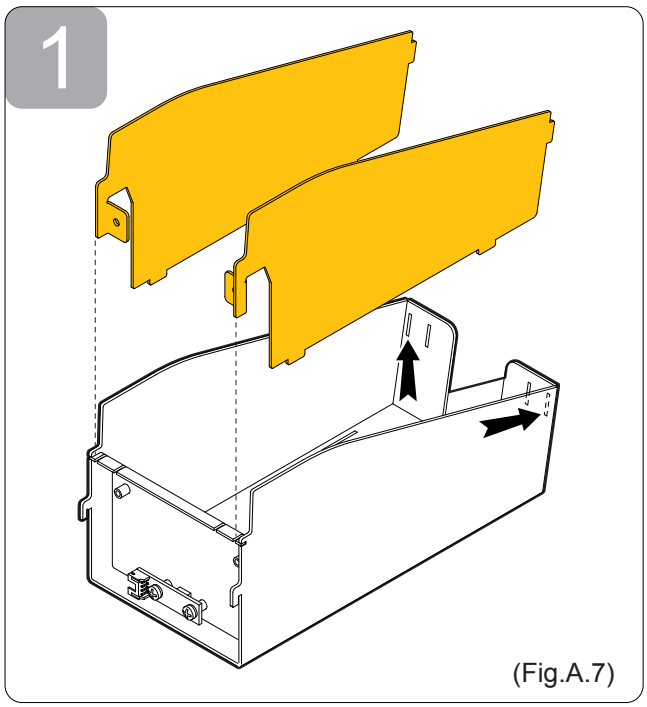
(Fig.A.5)



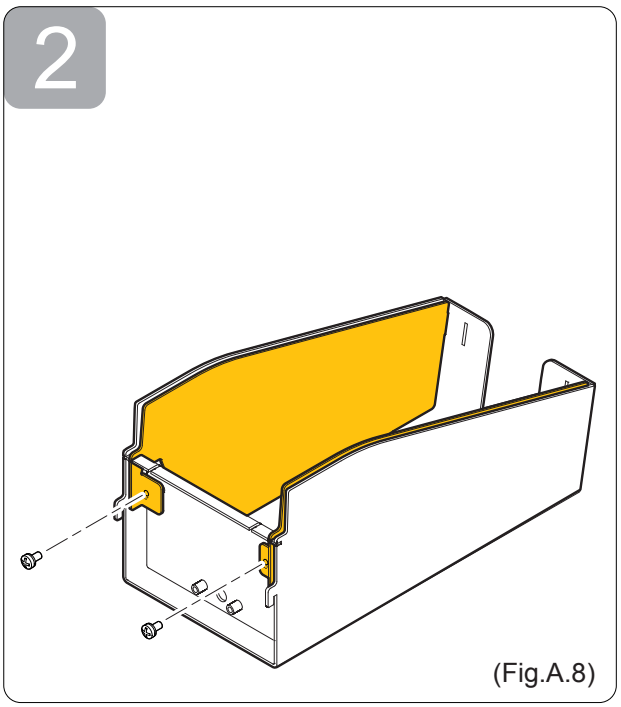
(Fig.A.6)

Using FanFold holder with paper 54 ÷ 72 mm:

- Insert the internal width adjustment plates with the right orientation using the fixing holes indicated from the arrows (see Fig.A7).
- Unscrew the two screw located on the back (see fig. A.8)



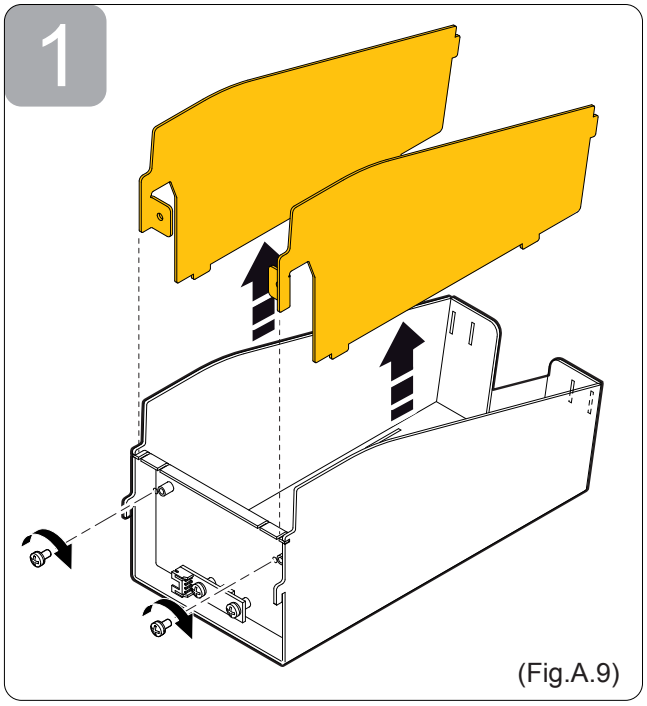
(Fig.A.7)



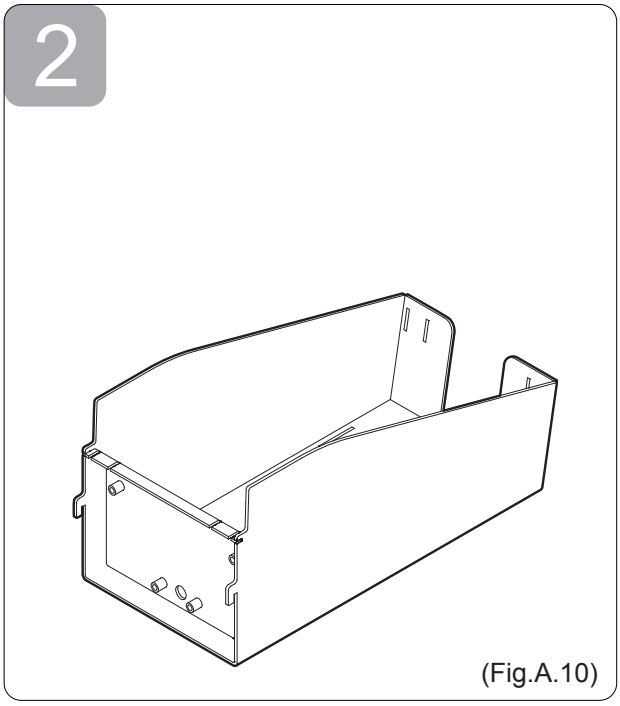
(Fig.A.8)

Using FanFold holder with paper 72 ÷ 82.5 mm:

- Use the FanFold holder without the internal width adjustment plates (see Fig.A.10). If necessary remove the internal width adjustment plates by using the two screws located on the back (see Fig.A9).



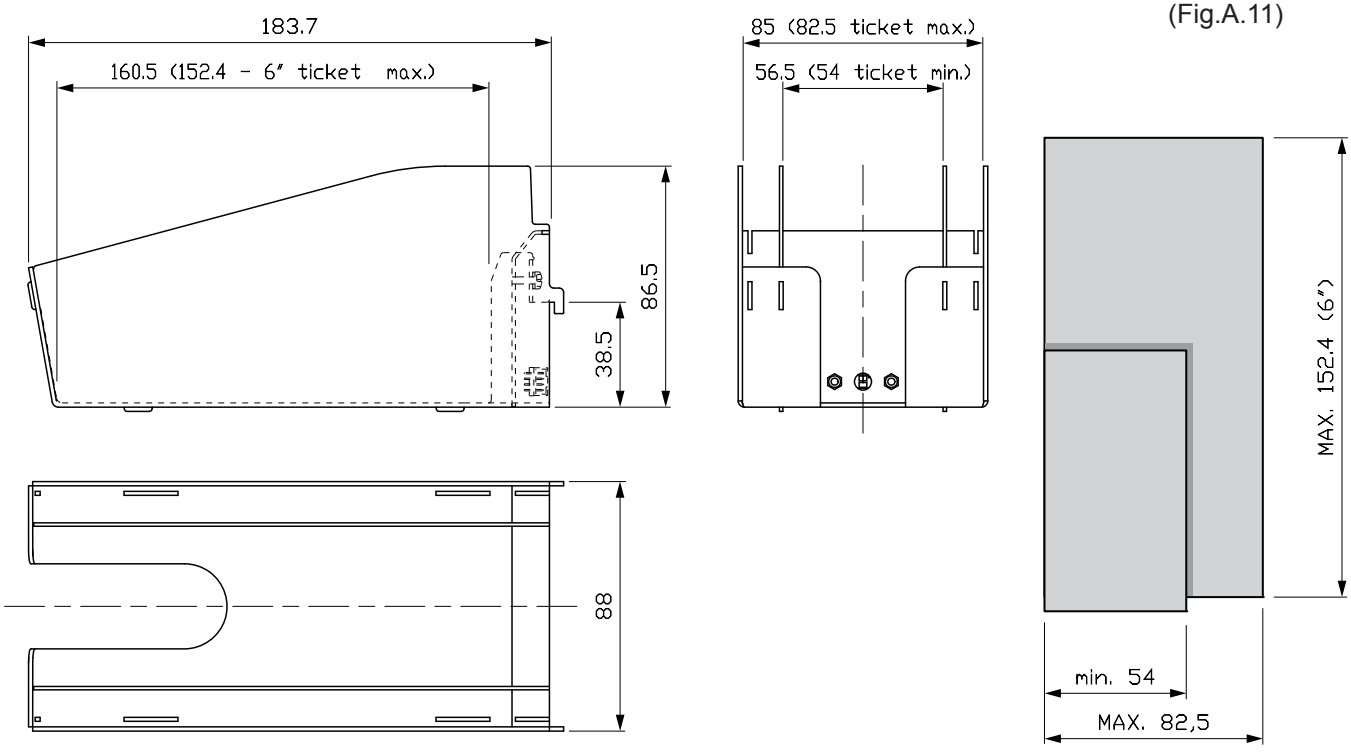
(Fig.A.9)



(Fig.A.10)

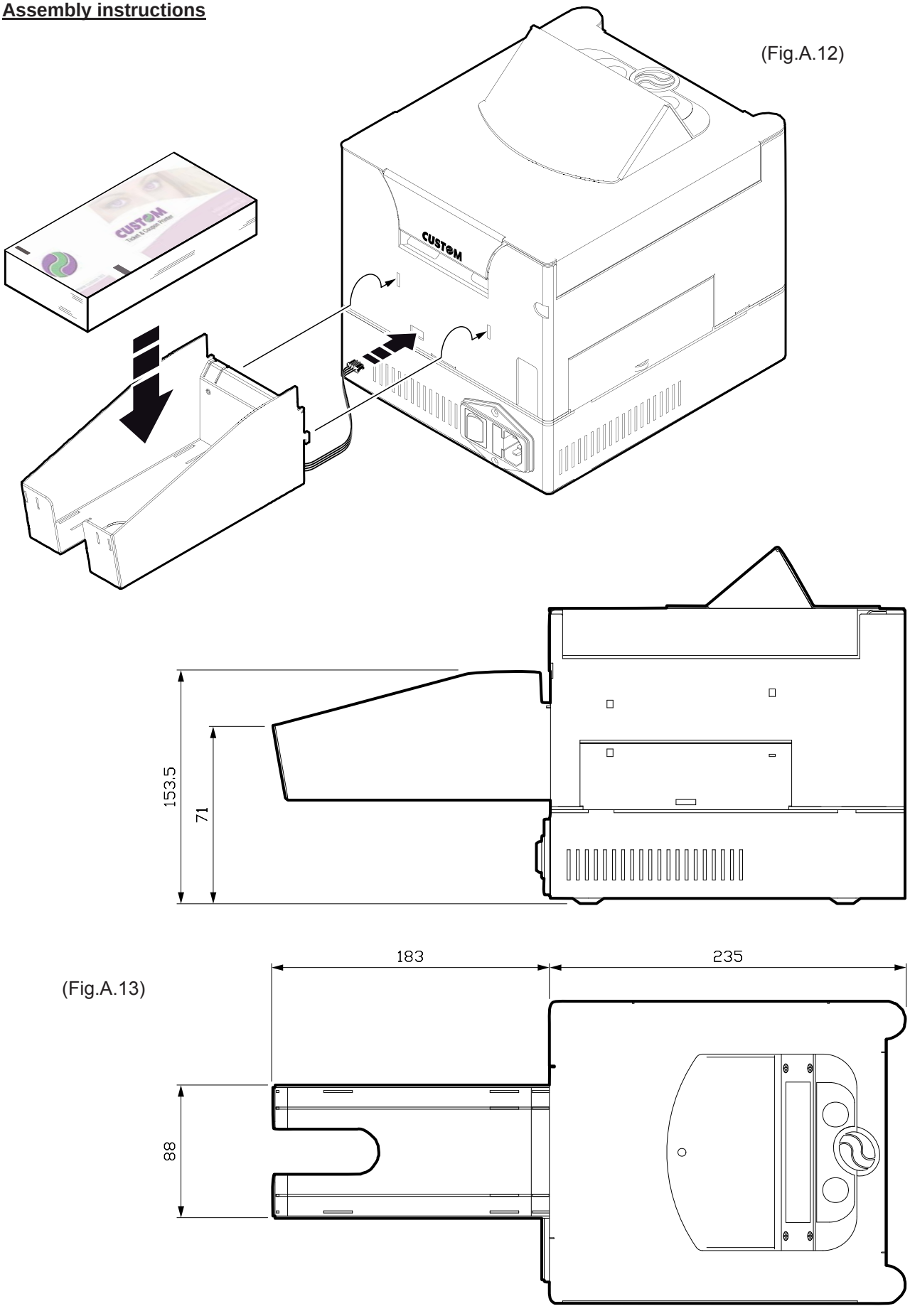
Technical specifications and dimensions

(Fig.A.11)



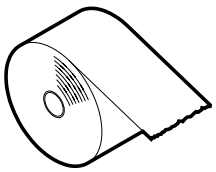
Assembly instructions

(Fig.A.12)

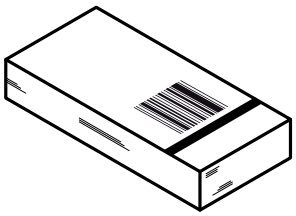


(Fig.A.13)

A.2 SUPPLIES



RCT80x180-25MM-165GR
Thermal paper roll 80mm Øext.=180 Øcore=25 165gr



RCTFF-B-155-65-255GR-N
FANFOLD module 155X65 neutral 255 grams

A.3 NOTES FOR TECHNICAL ASSISTANCE

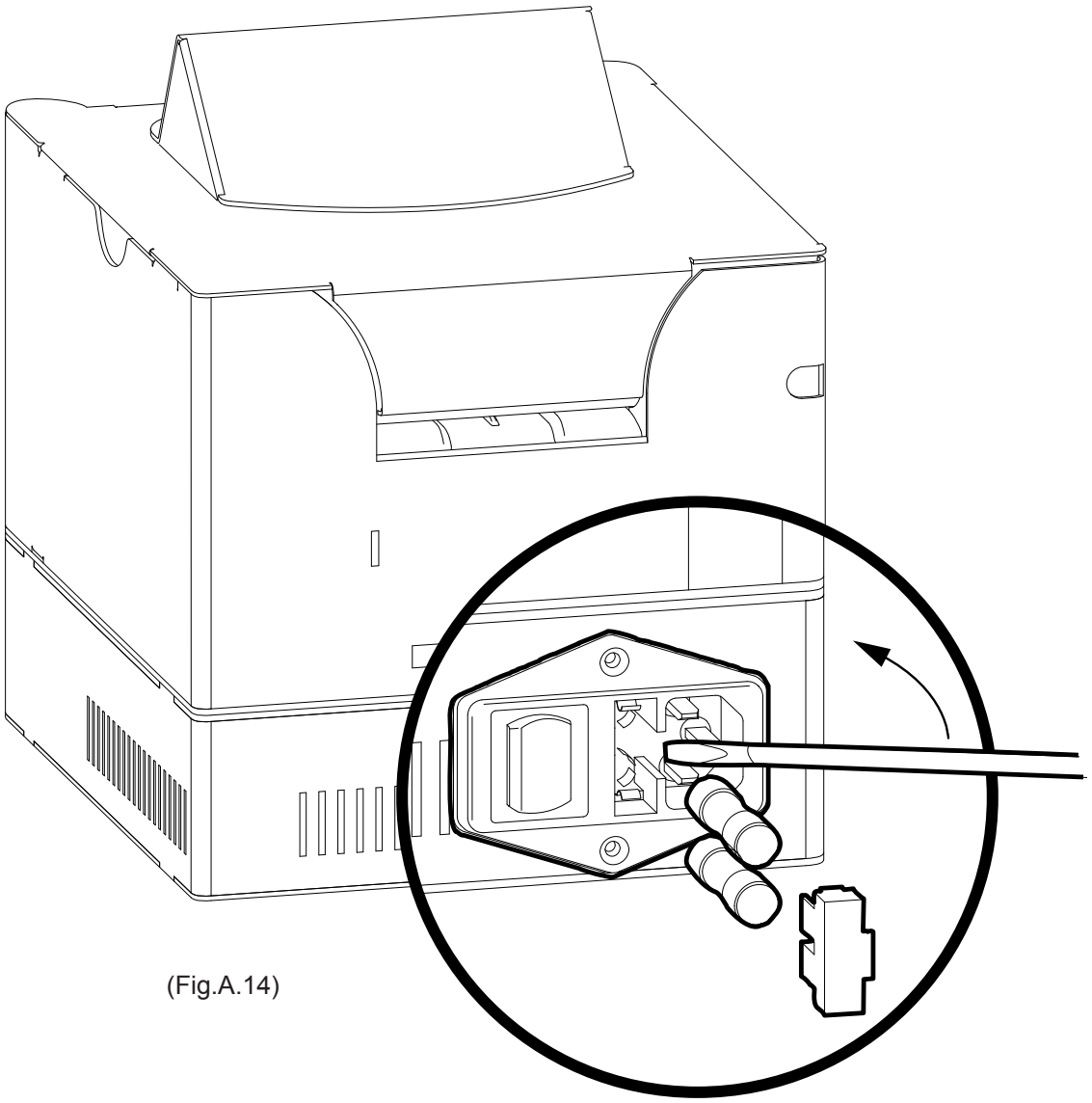
ATTENTION: The operations here described are exclusively aimed to the personnel handling the technical assistance of the printer.

ATTENTION: Before replacing the fuse, it's important to check up that the supply cable of the printer is out.

A.3.1 Replacing power supply fuse

The fuse is on the rear side of the printer (se Fig. A.14), proceed as follows:

- Remove the cover prising with a flat bladed screwdriver.
- Check the two fuse and replace if needed with a new one with same specifications.

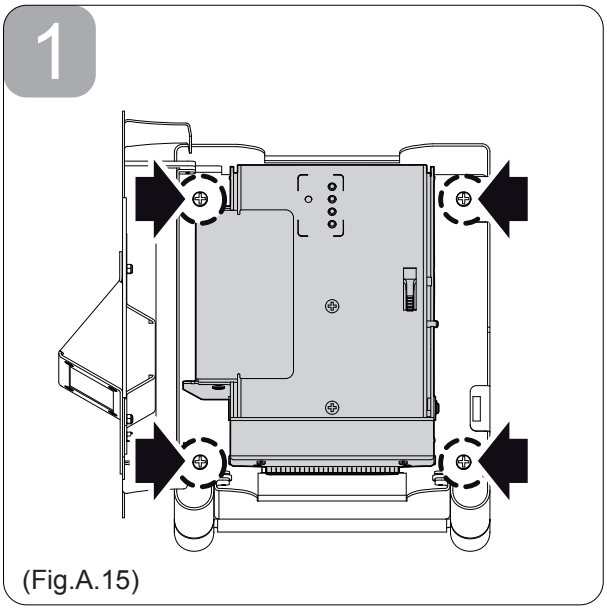


(Fig.A.14)

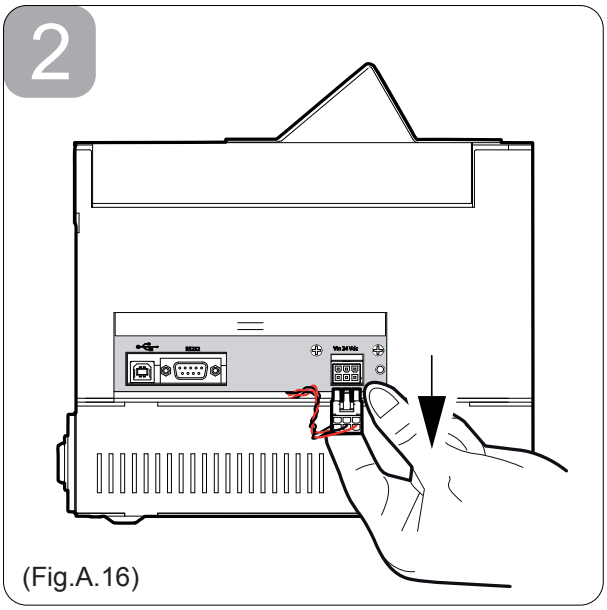
A.3.2 Replacing control board fuse

To replace the fuse on the control board of the printer, proceed as follows:

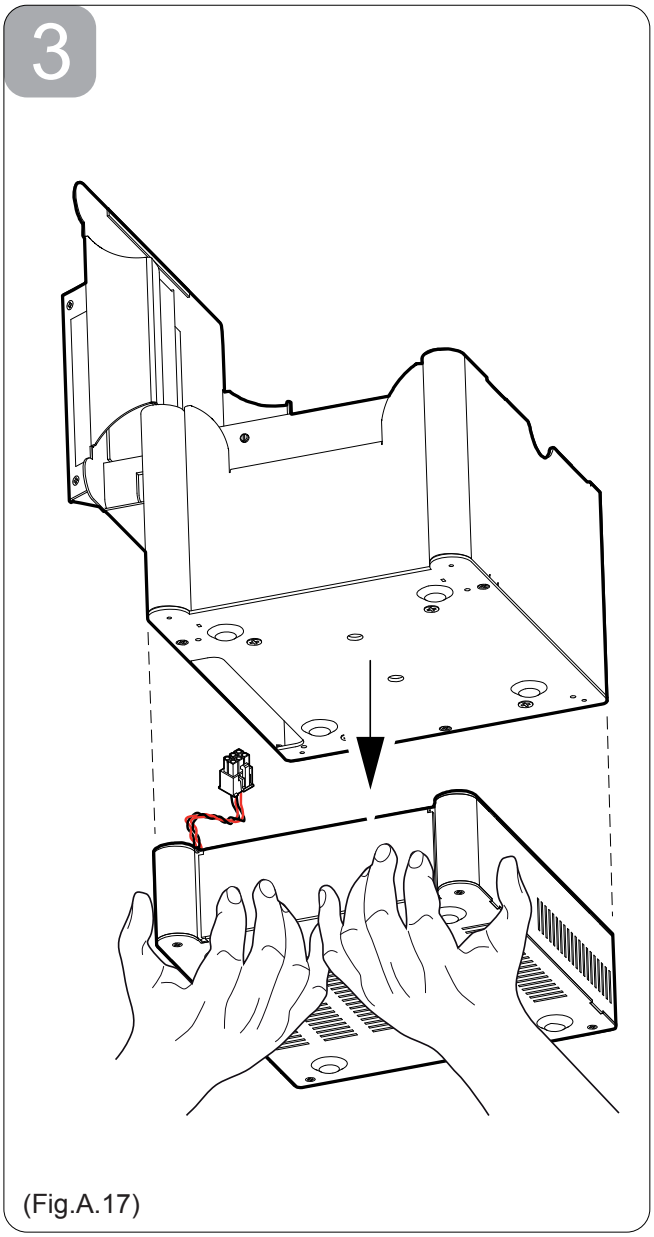
- Place the printer a even surface.
- Open the printer cover.
- Unscrew the four fixing screws of power supply (see Fig.A.15).
- Disconnect the power supply connector (see Fig.A.16).
- Remove the power supplier (see Fig.A.17).
- Unscrew the four fixing screws printer/case (see Fig.A.18).
- Unscrew the two fixing screws of the cover in the front side of the printer (See Fig.A.19).
- Disconnect all the connectors on the control board.
- Unscrew the four fixing screws for the control board in the bottom side (see Fig.A.20) and remove the control board.
- The fuse is on the control board of the printer, (see Fig.A.21). Un-solder the fuse at his end, paying attention to not heat excessively the closed components, to not take any risk to damage it.
- Replace the fuse with a new one with same specifications (10A, time delay, min. 60Vdc).
- Reassemble the printer using this instruction in reverse order.



(Fig.A.15)

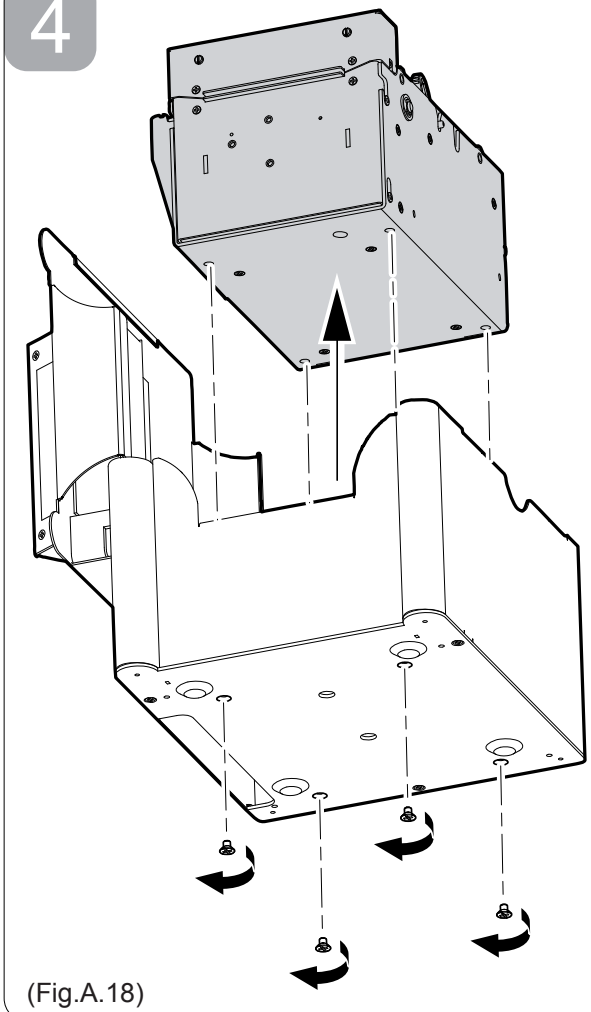


(Fig.A.16)



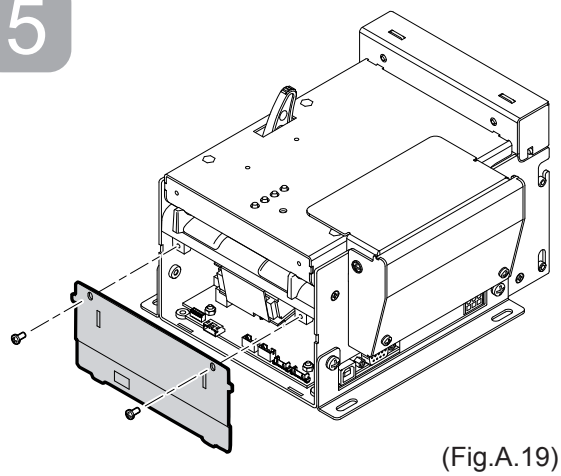
(Fig.A.17)

4



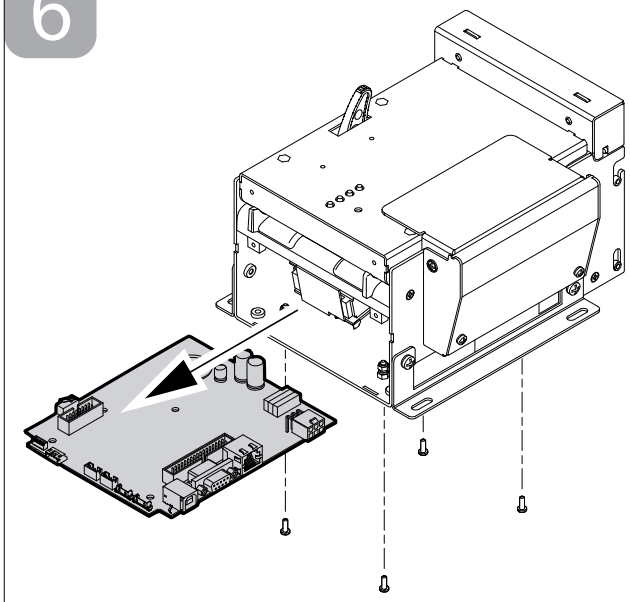
(Fig.A.18)

5



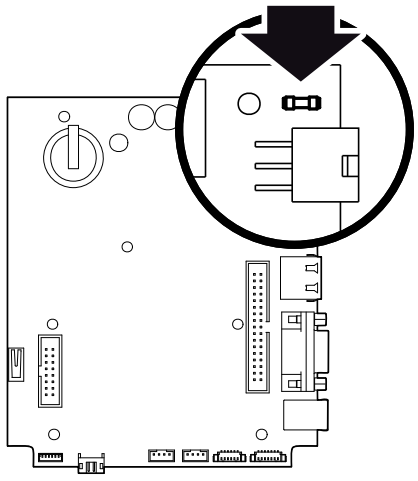
(Fig.A.19)

6



(Fig.A.20)

7



(Fig.A.21)

Blank page

B.1 TICKET ALIGNMENT

B.1.1 Ticket alignment

Paper with an alignment notch can be used in order to handle tickets with pre-printed fields and a fixed length; this printer manages both paper roll and fan-fold module.
To guarantee the alignment it is necessary that the *"Notch Position"* parameter is enabled from the key setup (see setting configuration parameters), that the alignment sensor is calibrated and that the parameters are set.
The calibration of the sensor occurs automatically within the printer setup or pressing the S1 key during power-up.

B.1.2 Enabling, calibrating and setting of parameters.

The printer manages tickets with notch; place the notch on the heat sensitive side or on the non heat sensitive side of the ticket; in central position or in the side position (see paragraph 1.6 Paper Specifications).
To guarantee a correct alignment it is necessary that the *"Notch Position"* parameter is setted with the right value because the printer must know which sensor utilize from notch searching.

All printer sensors are reflection sensors: this kind of sensor emits a beam of light and detects the quantity of light reflected to it.

The presence of the notch then is detected by the amount of light that returns to sensor, considering that the light is reflected by the white paper and absorbed by the black mark.

However is possible to use sensors coupled two by two (transparence sensors), using the sensor's transmitter with the receiver of the opposite: during this operating condition a beam of light is emitted by a sensor and the quantity of light which reaches the opposite receiver is detected.

The presence of the notch so is detected evaluating the amount of light that arrives to the opposite sensor, considering that the paper doesn't allow the beam of light to reach the receiver, whereas a gap (like label with gap) or hole, lets the light to reach the receiver.

***"Notch Position"* Parameter**	**Using mode**	**Notch position on ticket**	**Note**
Disabled	N.A.	N.A.	Alignment disabled
Low Side	REFLECTION	Lateral non thermal side	Using notch printed on ticket to align
Up Side	REFLECTION	Lateral thermal side	Using notch printed on ticket to align
Low Center	REFLECTION	Central non thermal side	Using notch printed on ticket to align
Up Center	REFLECTION	Central thermal side	Using notch printed on ticket to align
Tr. Side	TRASPARENCE	Lateral	Using ticket with gap or label with gap
Tr. Center	TRASPARENCE	Central	Using ticket with gap or label with gap

Calibration of the sensor occurs automatically and consists in adjusting the quantity of light emitted to adapt it to the degree of whiteness of the paper used.

To start self-calibration, the *"Notch Position"* parameter will be setted in a different value by *"Disabled"* value from the printer setup (see setting configuration parameters) or pressing the S1 key during power-up.

The printer will perform some paper FEEDS, at the end of which it will print the calibration result and the value of the PWM duty-cycle of the alignment sensor driver so that it can be perform an optimal notch detection, for example:

Autosetting Notch : **OK**
PWM Duty Cycle : **85.3%**

The *"Autosetting Notch"* parameter indicates the operating condition of the self-calibration process; OK will appear if it has been successful, but if it has failed the words NOT OK will appear.

Another parameter that needs to be set is the threshold:

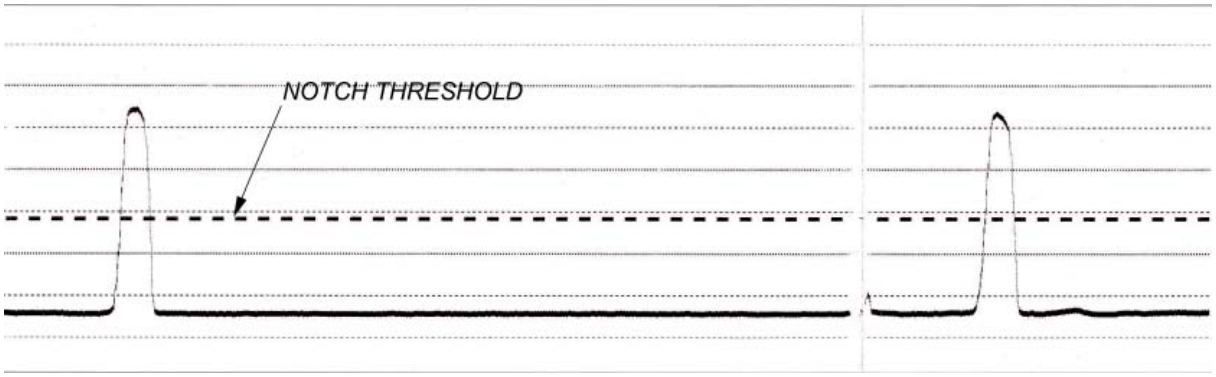
Notch Threshold.. : **40%**

It is used to detect the presence of the notch: if the voltage value read by the sensor exceeds the threshold value set the notch is identified, otherwise the white paper is considered.
In order to better identify the optimum threshold for the paper being used, a paper characterisation function is also available in setup.

Characterize Paper. :**Yes**

By activating this parameter the outgoing voltage of the sensor will be presented in a graphic form as shown in figure B.1 below:

PAPER CHARACTERIZATION (Fig.B.1)



NOTE
The outgoing voltage of the sensor will be presented in a graphic as a percentage value.

NOTE
This characterization paper is made using the fan fold module packed with the printer.

The graphic shows the outgoing voltage of the sensor and the threshold value previously set. It is clear that by adjusting the threshold value it is possible to find the best position that takes into account the signal peak and the small oscillations around zero.

The ALIGNMENT POINT is defined as the position inside the ticket that is the desired alignment point.
The ALIGNMENT POINT can be defined over the notch or near this one; for this reason, the final parameters to be set in setup are:

Notch Dist. [mm x 10] : **1**
Notch Dist. [mm x 1] : **5**
Notch Dist. [mm x .1] : **0**

These parameters define the *"Nocth Distance"* that represents the distance from the notch to align or simply identify the notch distance from the ticket margin; in the above example the notch distance is 15 mm.

(Fig.B.2)

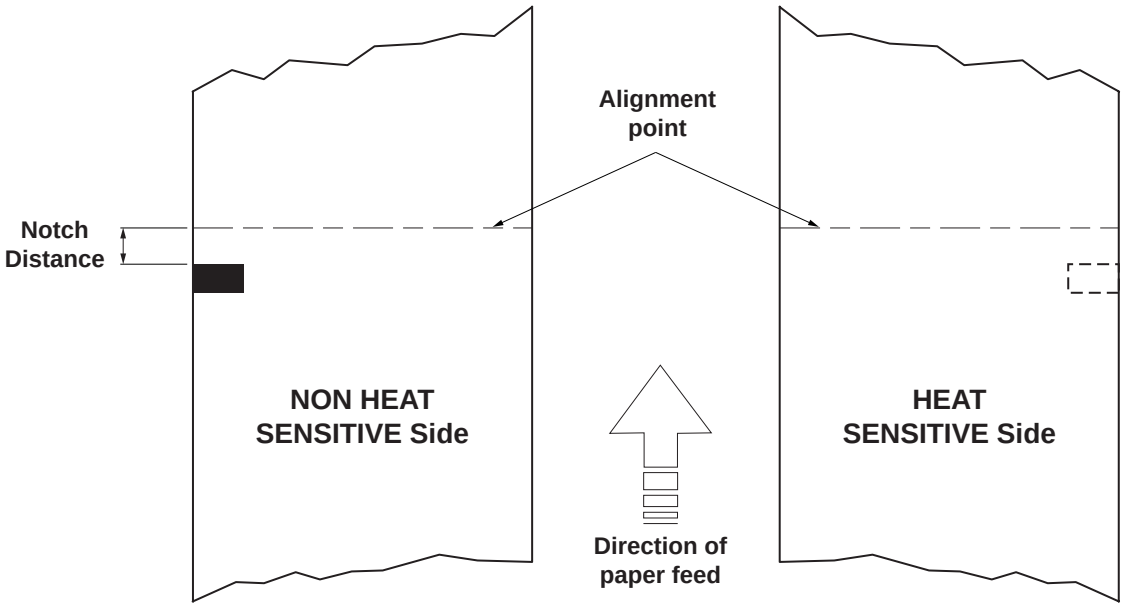
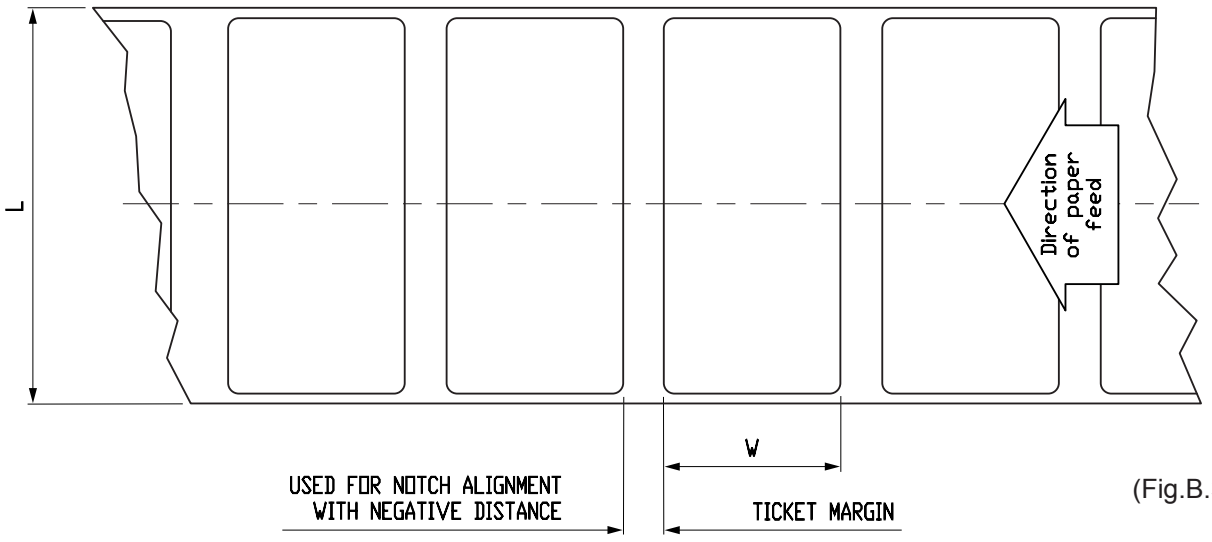


Figure B2 shows how the *"Notch Distance"* parameter represents the distance that exists between the notch and the desired alignment point. This parameter can have a minimum value of -5mm (negative value) and a maximum of 67 mm. In reality the maximum distance corresponds to the mechanical distance between the notch sensor and the head, and it is for this reason that higher values are not permitted.

To place the *"ALIGNMENT POINT"* before the notch, (or rather that the notch is external to the ticket used), setting the "Notch distance" to a negative value (see fig.B.3).



(Fig.B.3)

where

L : represents the paper width used (54 ¸ 82.5 mm);
W : indicates the minimum managed length 25.4 mm (1").

B.2 COMMANDS

B.2.1 Ticket Alignment

Two alignment commands are available: **$1D $F6** and **$1D $F8**.
The command **$1D $F6** performs an alignment to the print head: the paper is fed through until the print head is at the first available alignment point.
The command **$1D $F8** on the other hand refers to the cutter: the paper is fed through until the cutter is at the set alignment point, so that a subsequent cut will occur precisely at the alignment point.
Further explanations can be found in chapter 3 of this manual for command documentation.

B.2.2 Setting the alignment distance

The “Notch Distance” parameter can be changed via the printer setup or by using the command **$1D $E7 nH nL**. For further information refer to the command itself.

B.2.3 Examples.

N.B.: To a better comprehension, in the following figures, the Notch is indicated on the same side of the printing text.

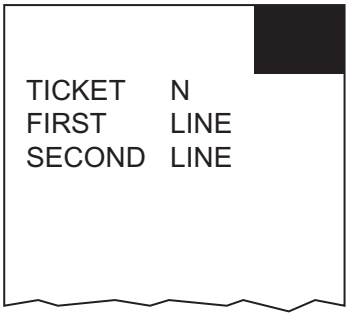
Example 1.

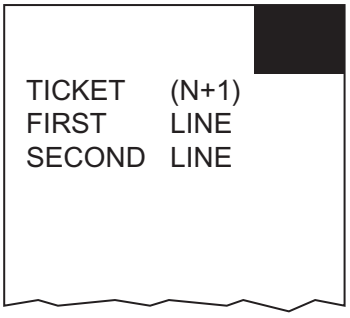
To print a ticket’s sequence witch the cut is made over the notch it’s necessary set the notch distance to zero as follows (this setting have effect after the ticket already in the printer):

{Set Notch Distance}
$1D,$E7,$00,$00,

{Print text}
‘TICKET 1’,$0A,’FIRST LINE’,$0A,’SECOND LINE’,$0A
{Cut alligment}
$1D, $F8,
{Cut}
ESC,’i’,
...

{Print text}
‘TICKET N ’,$0A,’FIRST LINE’,$0A,’SECOND LINE’,$0A
{Cut alligment}
$1D,$F8,
{Cut}
ESC,’i’,
...





(Fig.B.4)

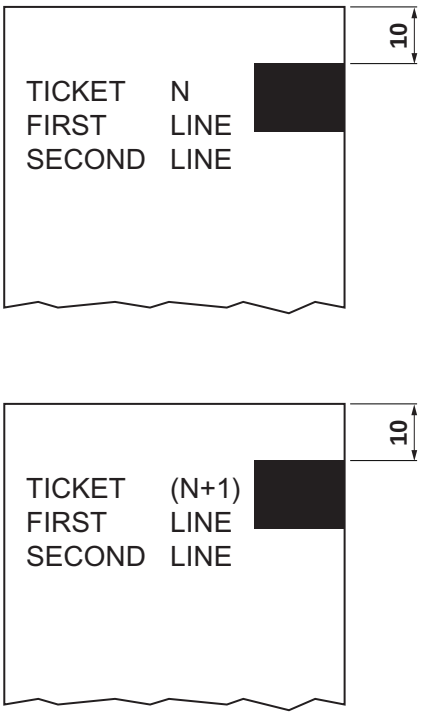
Example 2

To cut 10 mm before the notch the command sequence is (this setting have effect after the ticket already in the printer):

$1D, $E7, $00, $0A,

{Print text}
'TICKET 1',$0A,'FIRST LINE',$0A,'SECOND LINE',$0A
{Cut alignment}
$1D, $F8,
{Cut}
ESC,'i',
...

{Print text}
'TICKET 1',$0A,'FIRST LINE',$0A,'SECOND LINE',$0A
{Cut alignment}
$1D,$F8,
{Cut}
ESC,'i',
...



(Fig.B.5)

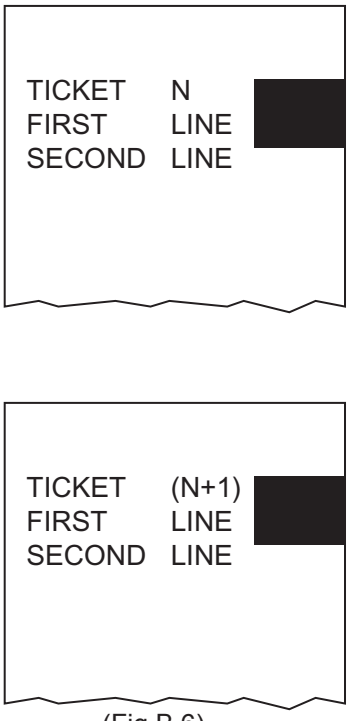
Example 3.

To print over the notch the command sequence is (this setting have effect after the ticket already in the printer):

{Set Notch Distance}
$1D,$E7,$00,$00,

{Head alignment}
$1D, $F6
{Print text}
'TICKET 1',$0A,'FIRST LINE',$0A,'SECOND LINE',$0A
{Cut}
ESC,'i'
...

{Head alignment}
$1D, $F6
{Print text}
'TICKET N',$0A,'FIRST LINE',$0A,'SECOND LINE',$0A
{Cut}
ESC,'i'



(Fig.B.6)

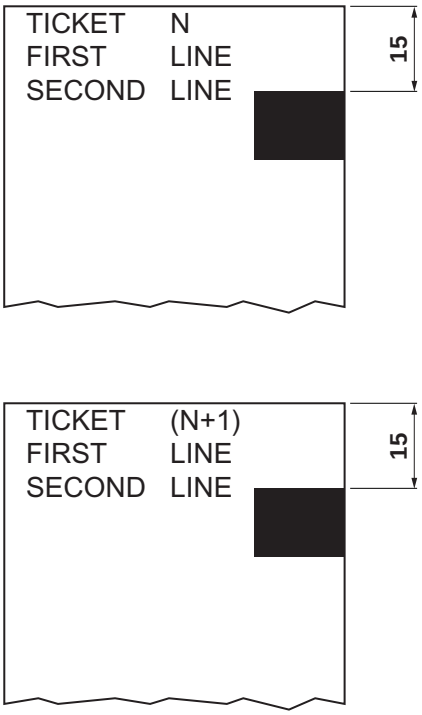
Example 4.

To print 15 mm before the notch the command sequence is (this setting have effect after the ticket already in the printer):

{Set Notch Distance}
$1D,$E7,$00,$0F,

{Head alignment}
$1D,$F6,
{Print text}
'TICKET 1',$0A,'FIRST LINE',$0A,'SECOND LINE',$0A
{Cut}
ESC,'i',
...

{Head alignment}
$1D,$F6,
{Print text}
'TICKET N',$0A,'FIRST LINE',$0A,'SECOND LINE',$0A
{Cut}
ESC,'i',



(Fig.B.7)

B.3 CHARACTERISTICS OF THE PAPER.

B.3.1 Position of sensors

Figure B.8 shows a section of the printer and the distances between the head, the cutter and the notch sensor.

(Fig.B.8)

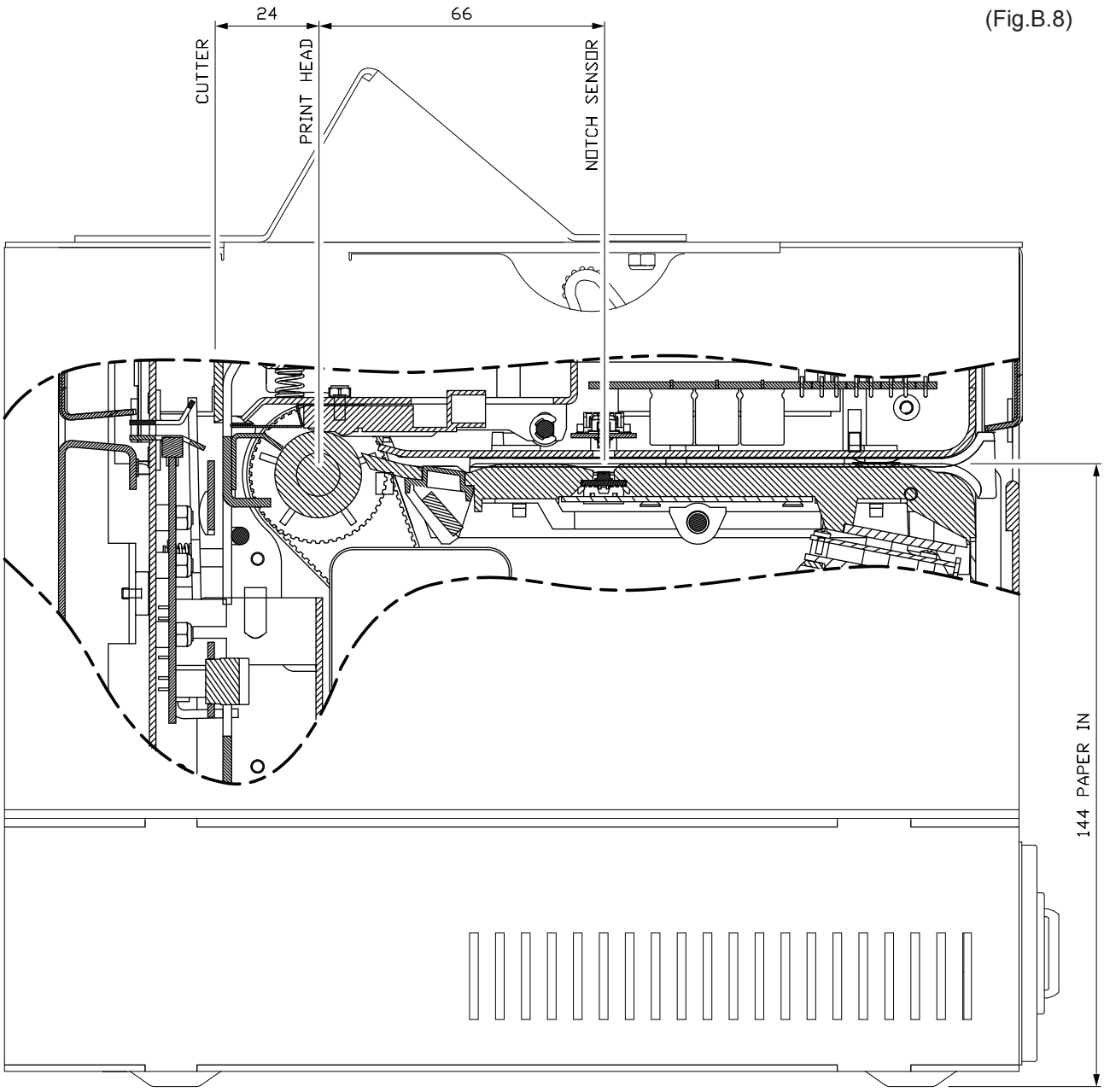


Figure B.8 clearly shows why the alignment distance (Notch Distance) cannot exceed the notch sensor-head distance. The moment that the notch sensor detects a notch, the head is already mechanically positioned 66 mm upstream of the of the notch in order therefore for it to align itself with this notch, as a reference the paper can only be fed forward, and so reduce the distance already there.

B.3.2 Dimension of tickets

It is very important to well calibrate the height of the printer area, according to the distance between the two edges of the notch. In order not to miss a notch (a ticket must therefore contain only one notch) the following equation must be used:

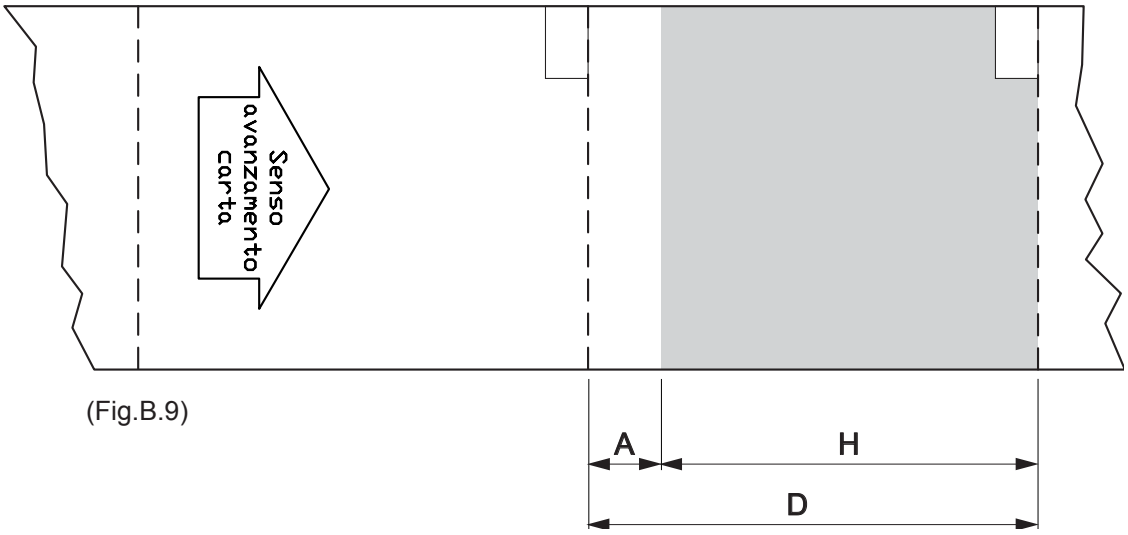
INTER-NOTCH DISTANCE>PRINTED AREA HEIGHT

where

INTER-NOTCH DISTANCE = the distance between two notch edges

The picture in figure B.9 shows a sequence of printed tickets aligning each one at the cut. It can be noted that increasing the printed area will result in superimposing what is to be printed at the subsequent notch. The size of the print area can be enlarged until it renders the alignment feed void, but not beyond.

LEGEND:
A = Alignment feed
H = Printing area height
B = Non printable area (CUTTER - PRINT HEAD)



(Fig.B.9)

NOTE
In ESC/POS™ emulation to prevent any jamming, after a cut, the paper is not completely recovered, but it remains outside of the printing line of 10mm; so it's very important to consider this distance, in this emulation, during the ticket layout definition.
In SVELTA emulation, directly designed for ticketing, on the contrary the paper recovering is not necessary, because after a cut non printable areas are not produced.

B.4 METHODS OF USAGE

B.4.1 Command sequences

It is possible, when printing sequences of tickets, to primarily identify three different methods of operation that involve the alignment: ticket aligned at the cut, ticket aligned at printing and combined alignment.

B.4.1.1 Alignment at the cut

The sequence of commands to be entered when wanting to align a ticket at the cut is as follows:

1. Ticket general setting; formatting of characters, print density, margins etc.
2. Print ticket: Printing of text, logos or any other graphics.
3. Alignment at the cut command: **$1D $F8**
4. Cut command

B.4.1.2 Alignment at printing

Alignment at printing requires the following sequence of commands:

1. Ticket general setting; formatting of characters, print density, margins etc.
2. Print alignment commands: **$1D $F6**
3. Print ticket: Printing of text, logos or any other graphics.
4. Cut commands

Unlike the previous case, the alignment feed takes place before the start of printing, so as to align the print area in the position required.

B.4.1.3 Combined Alignment

The combined alignment at printing and at the cut is the most alignment used on ticketing applications and requires the following sequence of commands:

1. Ticket general setting; formatting of characters, print density, margins etc.
2. Print alignment commands: **$1D $F6**
3. Print ticket: Printing of text, logos or any other graphics.
4. Alignment at the cut command
5. Cut command

This method of operation has favourable, compared with previously methods, because all printed tickets are the same length apart from the length of printable area.

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Part Number : DOME-TK300 Rev. 1.15

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