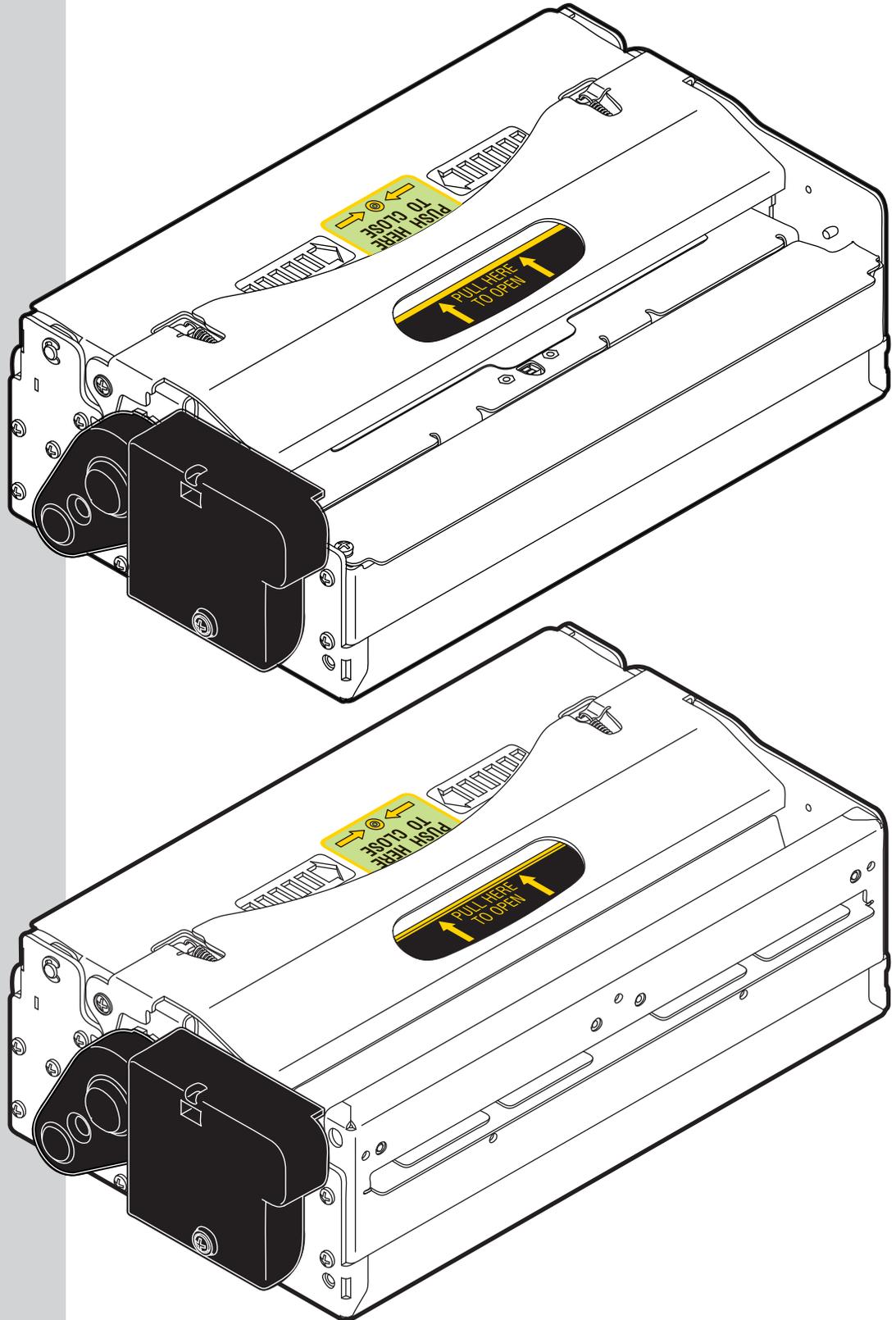


KM216H

USER MANUAL

OEM



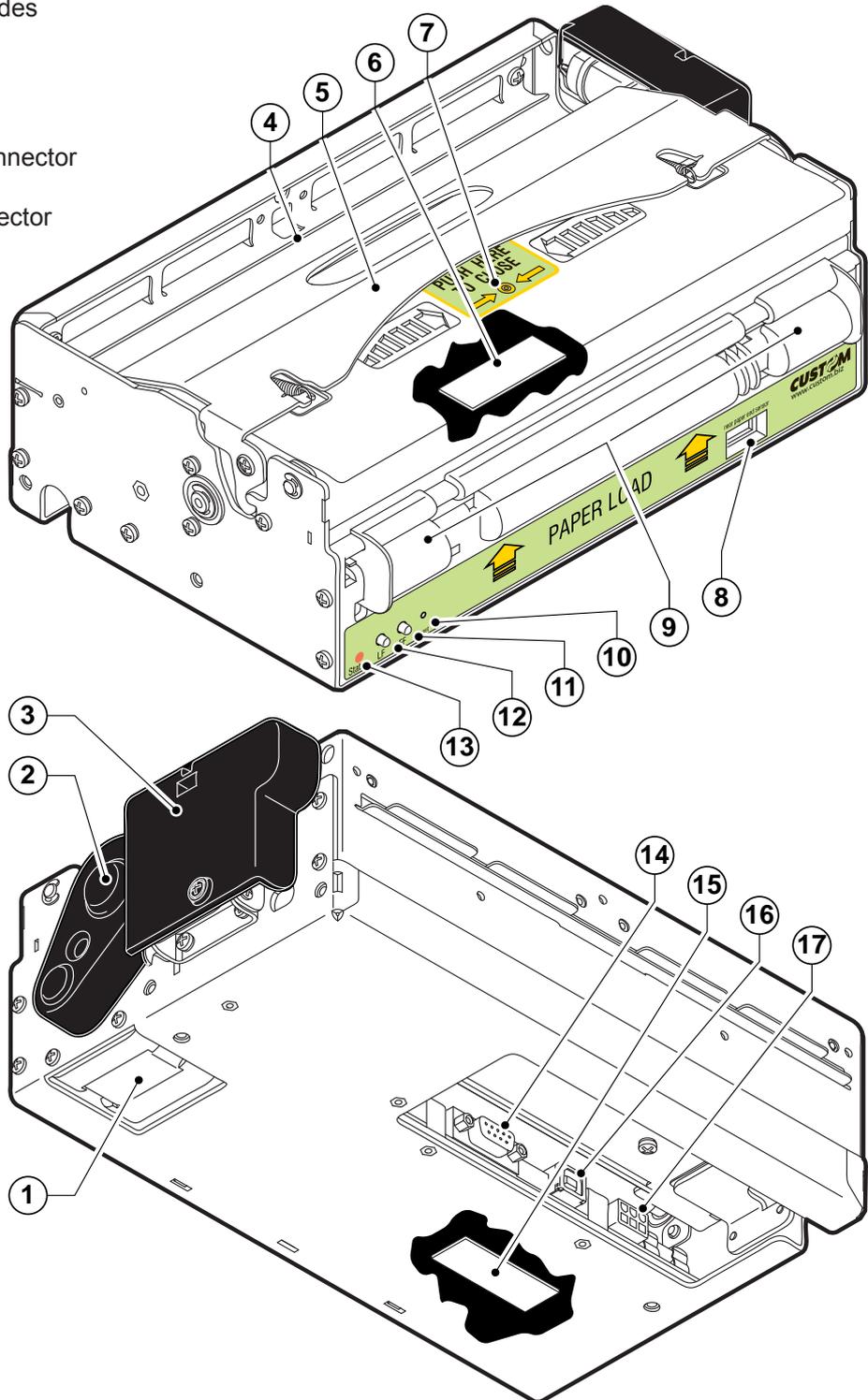
Command reference: **DOMC-0003E**

**The images used in this manual are used as an illustrative examples.
They couldn't reproduce the described model faithfully.**

**The informations given in this manual are referred to all models
unless otherwise specified**

KM216H-U PRINTER COMPONENTS

1. Feeding motor
2. Gears Protection
3. Cutter motor protection
4. Paper out
5. Opening lever
6. Paper sensor
7. Print head
8. Near paper end connector
(Paper roll holder support: OPTIONAL)
9. Adjustable paper feed guides
10. RESET button
11. FF Form Feed key
12. LF Line Feed Key
13. STATUS Led
14. RS232 serial interface connector
15. Notch sensor
16. USB serial interface connector
17. Power supply connector



KM216-U-0146 PRINTER COMPONENTS

1. Feeding motor
2. Gears Protection
3. Cutter motor protection
4. Paper out
5. Opening lever
6. Paper sensor
7. Print head
8. Near paper end connector
(Paper roll holder support: OPTIONAL)
9. Adjustable paper feed guides
10. RESET button
11. FF Form Feed key
12. LF Line Feed Key
13. STATUS Led
14. RS232 serial interface connector
15. Notch sensor
16. USB serial interface connector
17. Power supply connector

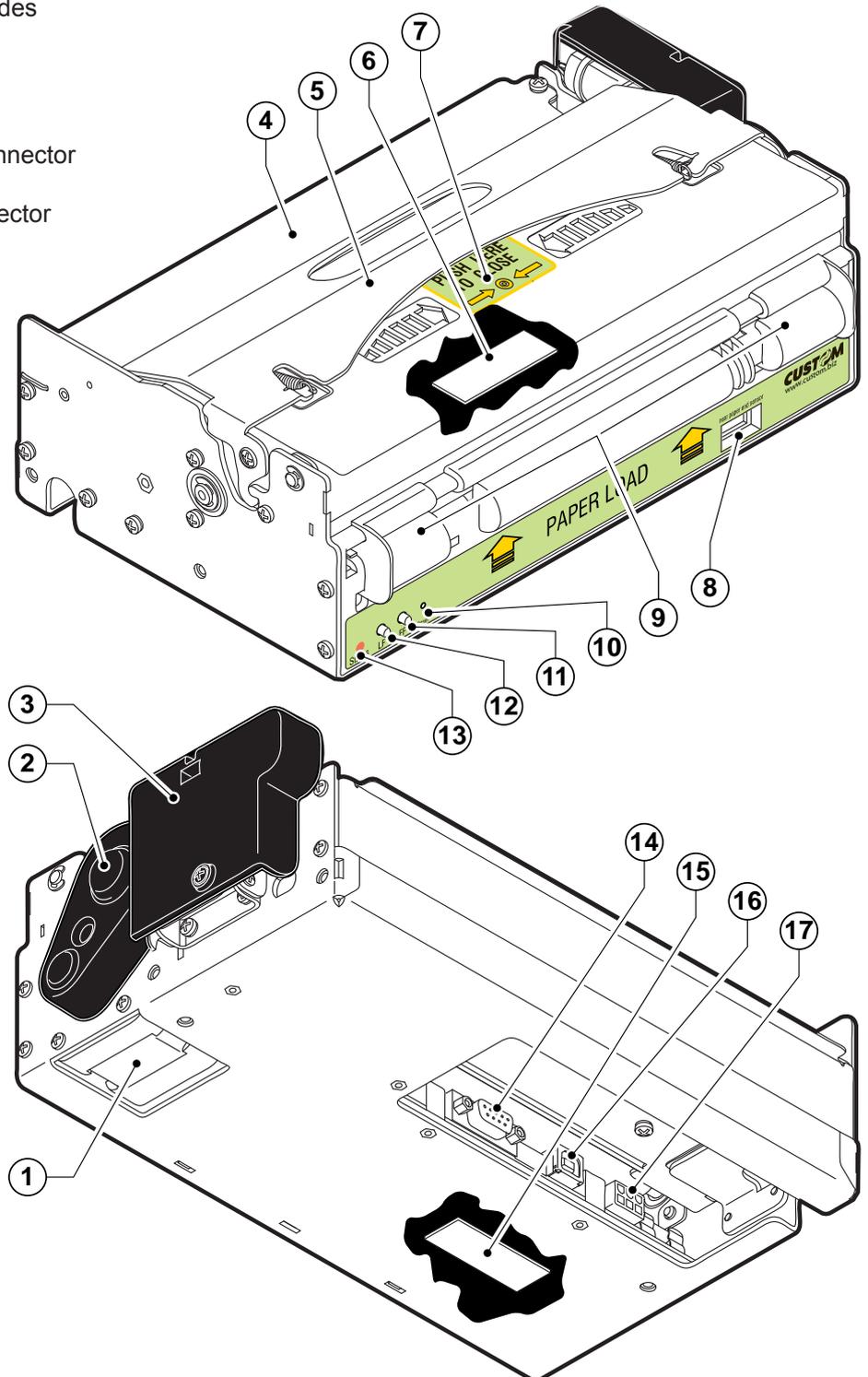


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1 INTRODUCTION

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

1.1 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.

1.2 General safety information

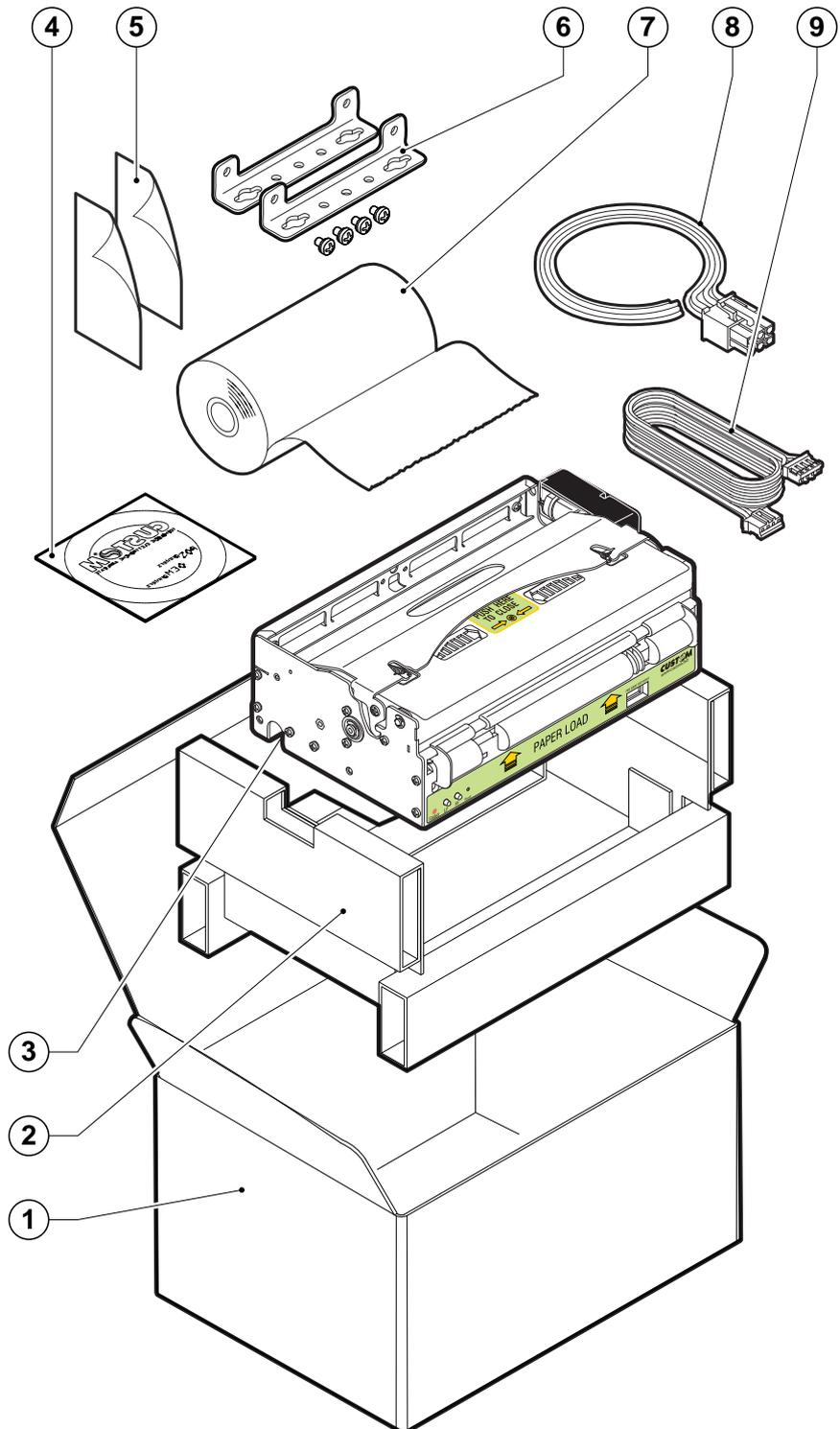
- Read and keep the instructions which follow.
- Follow all warnings and instructions indicated on the printer.
- Before cleaning the printer, disconnect the power supply.
- Clean the printer with a damp cloth. Do not use liquid or spray products.
- Do not operate the printer near water.
- Do not use 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 adequate 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.

1. INTRODUCTION

1.3 Unpacking the printer

Remove the printer from the carton, being careful not to damage the packing material in case the printer needs to be shipped in the future. Make sure that none of the components shown below are missing or damaged. If they are contact Customer Service.

1. Carton
2. Foam packing shell
3. Printer
4. User manual (or CD-ROM)
5. General instructions
6. Fixing brackets (additional)
7. Paper roll 216mm
8. Connecting cable for near paper end sensor
9. Power supply



- Open the printer packaging
- Remove the paper roll
- Remove the general instructions and user manual (or CD-ROM)
- Remove the power supply cable and connecting cable for near paper end sensor
- Remove the fixing brackets
- Remove the near paper end sensor
- Take out the foam packing shell
- Take out the printer
- Keep the box, trays and packing materials in the event the printer must be transported/shipped in the future.

1.4 General features

It's an A4/US letter format thermal printer designed for Internet, information and reservation kiosks and automatic teller (ATM) machines. It is equipped with a 204 dpi thermal printing mechanism and utilize 210/216 mm (8,5" - Letter)-wide paper rolls.

In addition to normal printing functions, the printer offers a wide array of special features:

- Paper width 210/216mm (8,5" - letter).
- Paper thickness 58/78 gr/m².
- Max paper roll diameter 180mm.
- High printing speed from 95 to 170 mm/sec.
- Serial RS232 + USB interface.
- No ejector available.
- High reliability rotary autocutter.
- Paper outlet friendly use inspection, thank to cutter easy to lift.
- Sensors: paper presence, notch, paper presence (cutter), print head set open, ticket availability (near paper end is optional).
- Optional paper roll support.

Dot Damage Prevention:

Possibility to enable a function that allows to prevent the deterioration of those dots stressed with special print-outs like graphics, tables and similar.

1. INTRODUCTION

1.5 Printer description

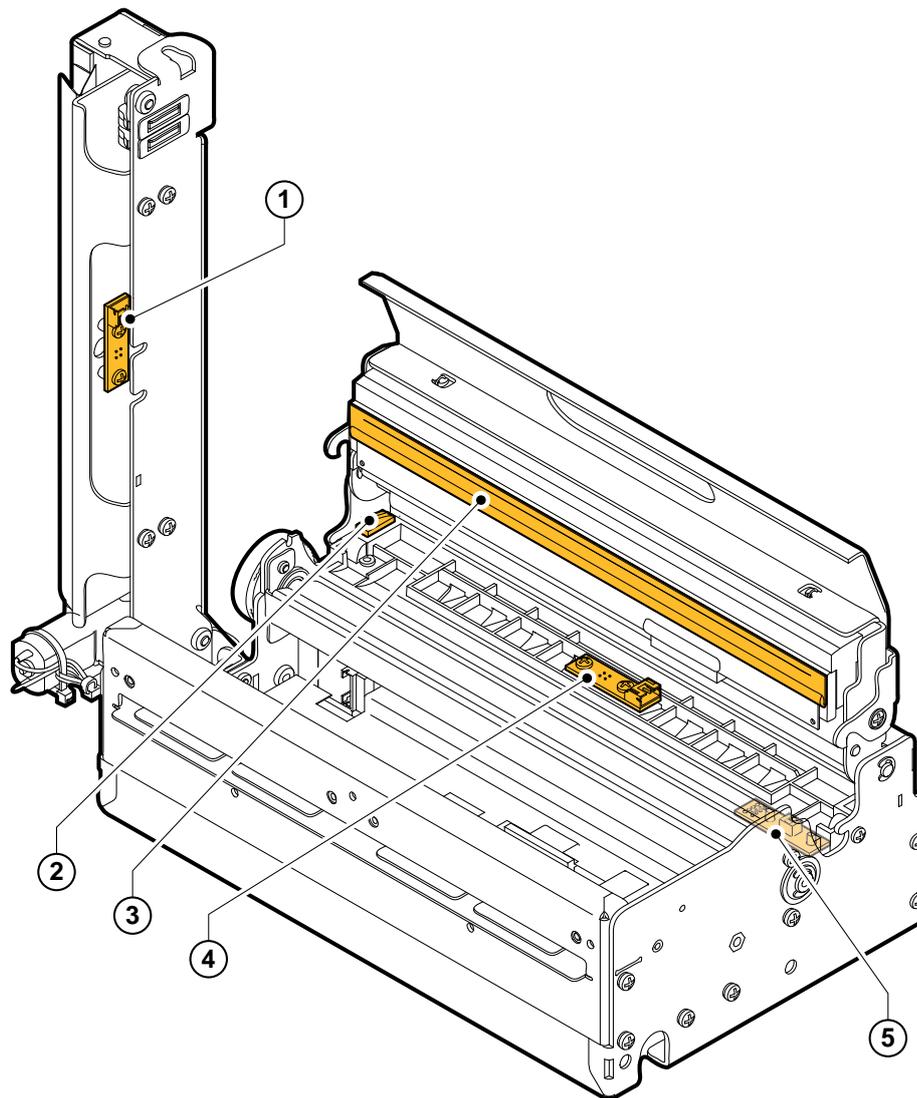
- **LF LINE FEED key** LF LINE FEED key. When the LINE FEED key is pressed, the printer advances the paper so that the paper may be inserted in the printing mechanism. During power-up, if the LF LINE FEED key is held down, the printer will perform the FONT TEST routine.
- **FF FORM FEED key** FF FORM FEED key. When the FF FORM FEED key is pressed, the printer advances the paper by a pre-set length. During power-up, if the FF FORM FEED key is held down, the printer enters the SETUP routine.
- **RESET key** Activating through a single-point tool (max diameter 2.5mm). When the Reset key is pressed, the printer executes an hardware reset such as the power shut off/ power on.
- **STATUS LED** STATUS LED displays printer hardware status. In case of malfunction, the colour and flash frequency changing as follows:

(Tab.1.1)

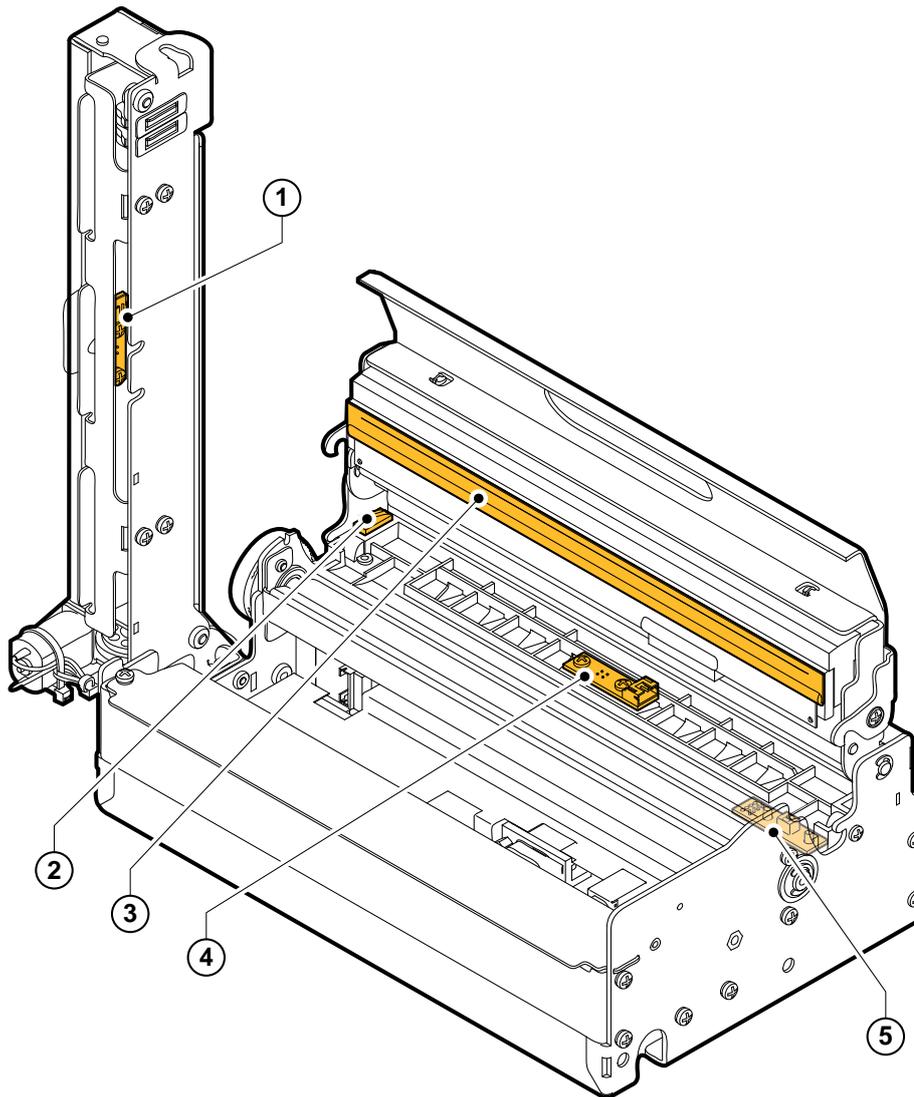
STATUS LED	COLOUR	DESCRIPTION	
	NONE	Printer OFF	
	GREEN	Printer ON: no error	
	GREEN	COMMUNICATION STATUS	
		Nr Flashing	Description
		1	Data receive
		2	Receptions errors (parity, frame error, overrun error)
		3	Misinterpret command
		4	Command reception time out
	YELLOW	RECOVERING ERROR	
		Nr Flashing	Description
		2	Heading over temperature
		3	Paper end
		4	Paper jam
		5	Power supply voltage incorrect
		6	Cover opened
	RED	UNRECOVERING ERROR	
		Nr Flashing	Description
		3	RAM error
		4	EEPROM error
		5	Cutter error

1.6 Sensors position

KM216H-U



- 1 **Paper presence sensor (on cutter)**
An infrared reflex sensor comprised of 1 diode (emitter) and a photo transistor (receiver). This sensor detects paper presence on the cutter unit. Cutting is executed if the sensor detects the paper is present.
- 2 **Printing head set open**
An mechanical sensor (microswitch), detects when the printing head set is open or closed.
- 3 **Head temperature sensor**
The thermal sensor takes the temperature of the thermal head. When the thermal head overheats, the printer leads in error and the led blinks two times of a yellow colour. The sensor is placed on print head and it is not visible to the user.
- 4 **Paper presence sensor (paper feed)**
An infrared reflex sensor comprised of 1 diode (emitter) and a photo transistor (receiver). This sensor detects paper presence in paper feed. Printing is interrupted when the sensor detects that no paper is present.
- 5 **Notch sensor**
An infrared reflex sensor comprised of 1 diode (emitter) and a photo transistor (receiver). This sensor detects notch presence on paper.



- 1 **Paper presence sensor (on cutter)**
An infrared reflex sensor comprised of 1 diode (emitter) and a photo transistor (receiver). This sensor detects paper presence on the cutter unit. Cutting is executed if the sensor detects the paper is present.
- 2 **Printing head set open**
An mechanical sensor (microswitch), detects when the printing head set is open or closed.
- 3 **Head temperature sensor**
The thermal sensor takes the temperature of the thermal head. When the thermal head overheats, the printer leads in error and the led blinks two times of a yellow colour. The sensor is placed on print head and it is not visible to the user.
- 4 **Paper presence sensor (paper feed)**
An infrared reflex sensor comprised of 1 diode (emitter) and a photo transistor (receiver). This sensor detects paper presence in paper feed. Printing is interrupted when the sensor detects that no paper is present.
- 5 **Notch sensor**
An infrared reflex sensor comprised of 1 diode (emitter) and a photo transistor (receiver). This sensor detects notch presence on paper.

2 INSTALLATION AND USE

2.1 Power Supply

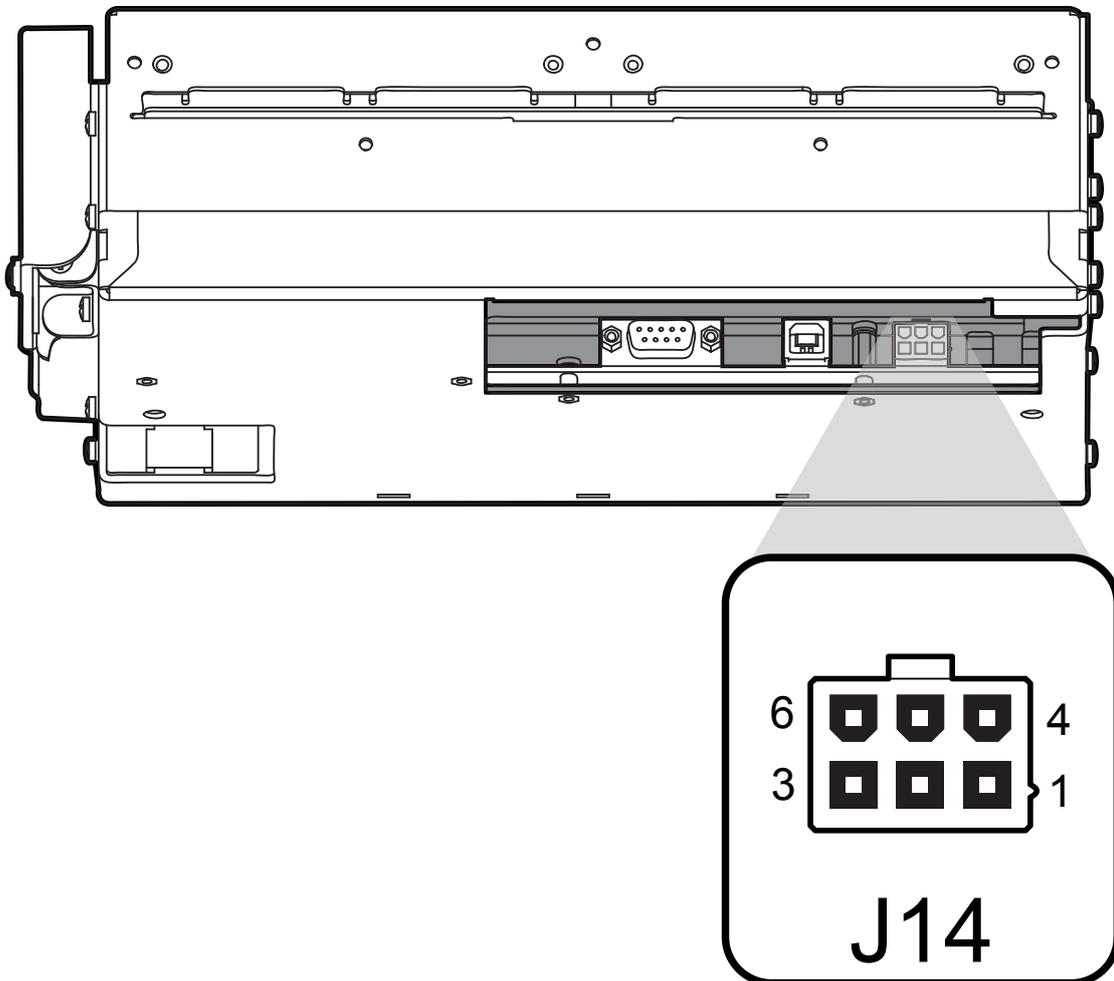
The printer is equipped with an external power supply outlet (see Fig. 1.1). The connector pin configuration is as follows:

MODEL No. TYPE:

Header: Molex 39-30-0060 (Vertical)

Housing: Molex 39-01-2065

PIN	SIGNAL
1	+ 24V
2	+ 24V
3	+ 24V
4	GND
5	GND
6	GND



(Fig.1.1)



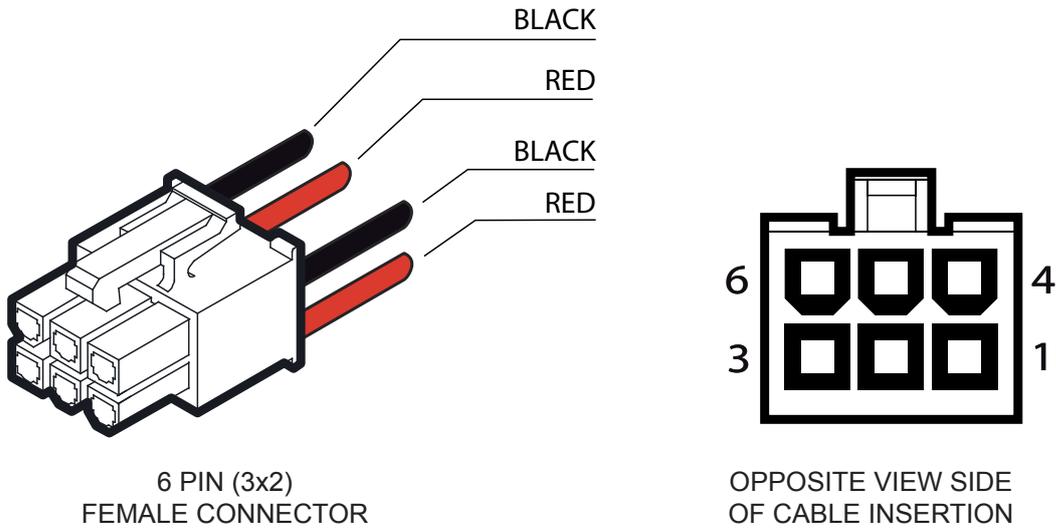
WARNING

Respect power supply polarity.

2. INSTALLAZION AND USE

This picture shows the power supply cable included in the printer packaging :

(Fig.1.2)



The connector pin configuration of this cable is as follows:

(Tab.1.2)

FEMALE CONNECTOR	CABLE COLOUR	SIGNAL
Pin 1	Red	+24V
Pin 2	Not connected	+24V
Pin 3	Red	+24V
Pin 4	Black	GND
Pin 5	Not connected	GND
Pin 6	Black	GND



NOTE: The red cable is for +24 Vdc.
The black cable is for signal ground.

2.2 Self-test

During power-up, if the FF FORM FEED key is held down, the printer enters the autotest routine and prints out the Setup report (see fig.1.3). The printer will remain in Hexadecimal dump mode (See par.2.4) until another key is pressed or characters are received through the printer communication port.

PRINTER SETUP	
INTERFACE	RS232
PROGRAM MEMORY TEST.....	OK
DYNAMIC RAM TEST.....	OK
EEPROM TEST.....	OK
CUTTER TEST.....	OK
HEAD VOLTAGE [V]	= 24.71
HEAD TEMPERATURE [°C]	= 23
PAPER PRINTED [cm]	= 840
CUTCOUNTER	= 604
POWER ON COUNTER	= 189
RS232 Baud Rate ⁽¹⁾	11520 bps
RS232 Data Length ⁽¹⁾	8 bits/chr
RS232 Parity ⁽¹⁾	None
RS232 Handshaking ⁽¹⁾	XON/XOFF
Busy Condition ⁽²⁾	RxFull
USB Address N. ⁽³⁾	0
USB Status Mon ⁽⁴⁾	Disabled
Autofeed	CR Disabled
Print Mode	Normal
Chars / inch	A=11 B=15 cpi
Speed / Quality.....	Normal
Dot Damage Prevention ⁽⁵⁾	Disabled
Notch Alignment	Disabled
Print Density.....	0%
[FF] key to enter setup	
[LF] key to skip setup	

Printer operating status is indicated in the configuration print-out in which, next to the name of the components displayed (see figure 1.5), the following information is given:

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

2. INSTALLAZION AND USE

2.3 Configuration

This printer permits the configuration of default parameters. The printer's configurable parameters are:

- **RS232 Baud Rate** ⁽¹⁾: 230400, 115200^D, 57600, 38400, 19200, 9600, 4800, 2400, 1200.
- **RS232 Data length** ⁽¹⁾: 7, 8^D bits/car.
- **RS232 Parity** ⁽¹⁾: None^D, even or odd.
- **RS232 Handshaking** ⁽¹⁾: XON/XOFF^D or Hardware.
- **Busy condition** ⁽²⁾: RxFull^D or OffLine/RxFull.
- **USB Address Number** ⁽³⁾ : 0^D, 1, 2, 3, 4, 5, 6, 7, 8, 9.
- **USB Status Monitor** ⁽⁴⁾: Disabled^D or Enabled
- **Print mode**: Normal^D or Reverse.
- **Autofeed**: CR disabled^D or CR enabled.
- **Chars/Inch**: A=11 B=15 cpi^D, A=15 B=20 cpi.
- **Speed/Quality** : Normal^D, High quality or High Speed.
- **Dot Damage Prevention** ⁽⁵⁾: Disabled^D, ± 7 dot or ± 15 dot.
- **Notch Alignment** : Disabled^D or Enabled.
- **Notch Threshold** ⁽⁶⁾: 0,5 V, 1,0 V, 1,5 V, 2,0 V, 2,5 V, 3,0 V, 3,5 V ^D, 4,0 V, 4,5 V.
- **Notch Distance [mm]** ⁽⁶⁾: 0^D.
- **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. Settings remain active even after the printer has been turned off.

Nota⁽¹⁾ Parameter valid only with serial interface;

Nota⁽²⁾ 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.

Nota⁽³⁾ This parameter is 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.

Nota⁽⁴⁾ 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.

Nota⁽⁵⁾ Function, if enabled, allows to prevent the deterioration of dots stressed with special print-outs like graphics, tables and similar.

Nota⁽⁶⁾ The parameter "Notch distance" is displayed and enabled only in case that the notch alignment parameter is enabled. The parameter "Notch distance" is used to set the exact distance of the notch entering the desired value in millimetre and in deci-millimetre.

When the FORM FEED key is pressed, the printer enters parameter configuration.

When the LINE FEED key is pressed, the printer exits setup and terminates the Hexadecimal dump function.

When the receive buffer is full, if handshaking is set to XON/XOFF, the printer sends the XOFF (\$13) on the serial port.

When the receive buffer has cleared once again, if handshaking is set to XON/XOFF, the printer sends the XON (\$11) on the serial port.

The settings made are stored in EEPROM (nonvolatile memory).

2.4 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 (see Fig. 1.4). 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 from the communications 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).

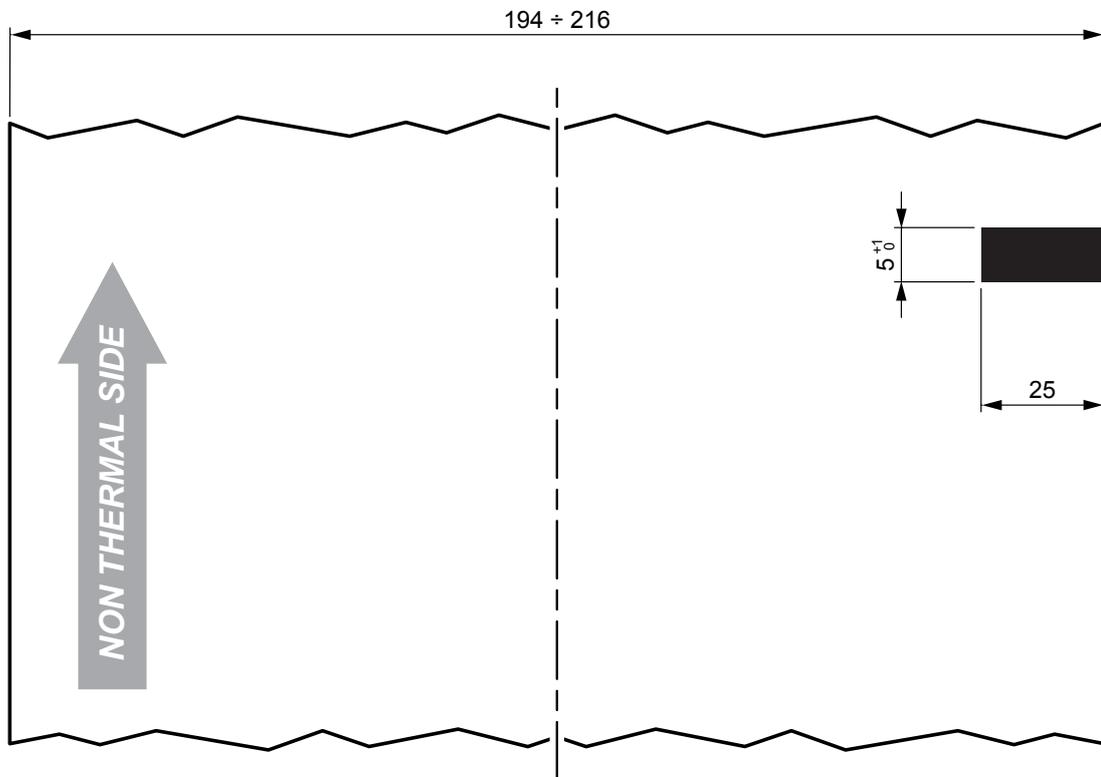
HEXADECIMAL DUMP		ASCII DUMP
0x00000	48 65 78 61 64 65 63 69 6D 61 6C 20 64 75 6D 70 20 66 75 6E 63 74 69 6F	Hexadecimal dump functio
0x000018	6E 20 30 31 32 33 34 35 36 37 38 39 20 61 62 63 64 65 66 67 68 69 6A 6B	n 0123456789 abcdefghijk
0x000030	6C 6D 6E 6F 70 71 72 73 74 75 76 77 78 79 7A 2E	lmnopqrstuvwxyz.

(Fig.1.4)

2.5 Ticket characteristics

It's possible to use paper with alignment mark. The figure 1.5 shows paper with alignment mark fac-simile; the notch distance in mm from the beginning of the document must be setting during the printer setup.

(Fig.1.5)



NOTE:
Minimum distance between two notch is 148,5 mm.

2. INSTALLAZION AND USE

2.6 Maintenance



WARNING

Make sure no water or other liquids seep inside the printer.



BEWARE

Before any type of work is done on the machine, disconnect the power supply cord from the mains outlet.



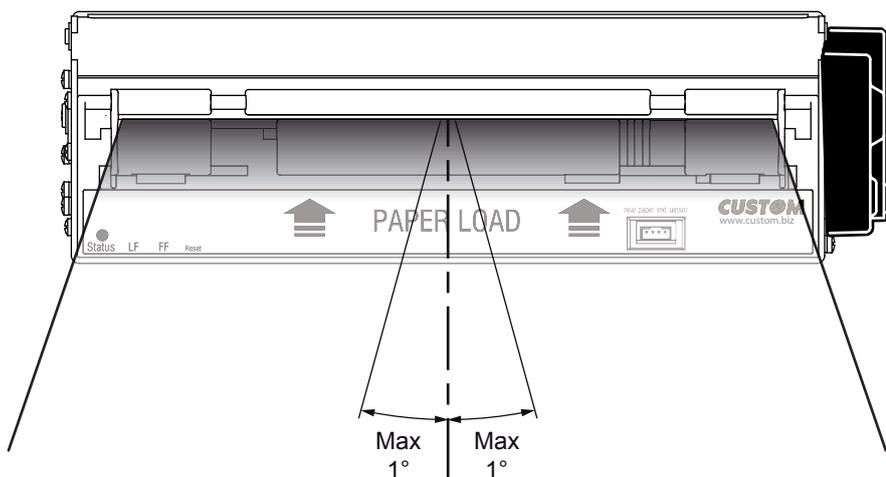
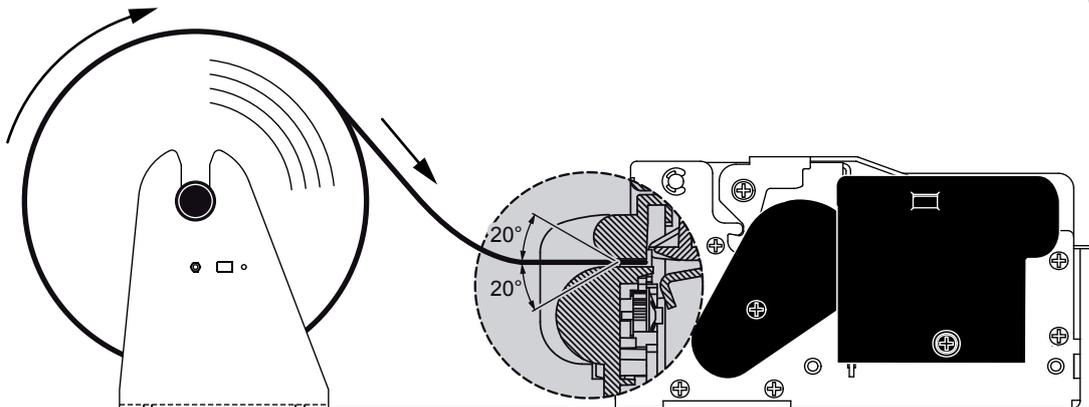
ATTENTION

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.

2.6.1 Paper load specifications

To correctly load the paper, follow the alignment instructions shown in figs. 1.16 and 1.17.

(Fig.1.16)



(Fig.1.17)



WARNING

Make sure the paper and printer are aligned.

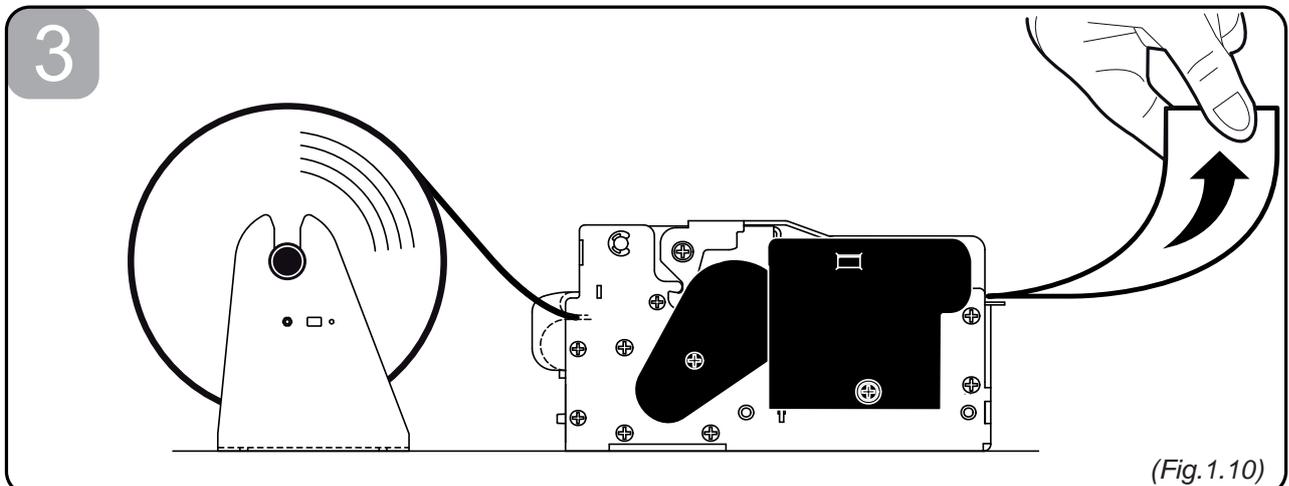
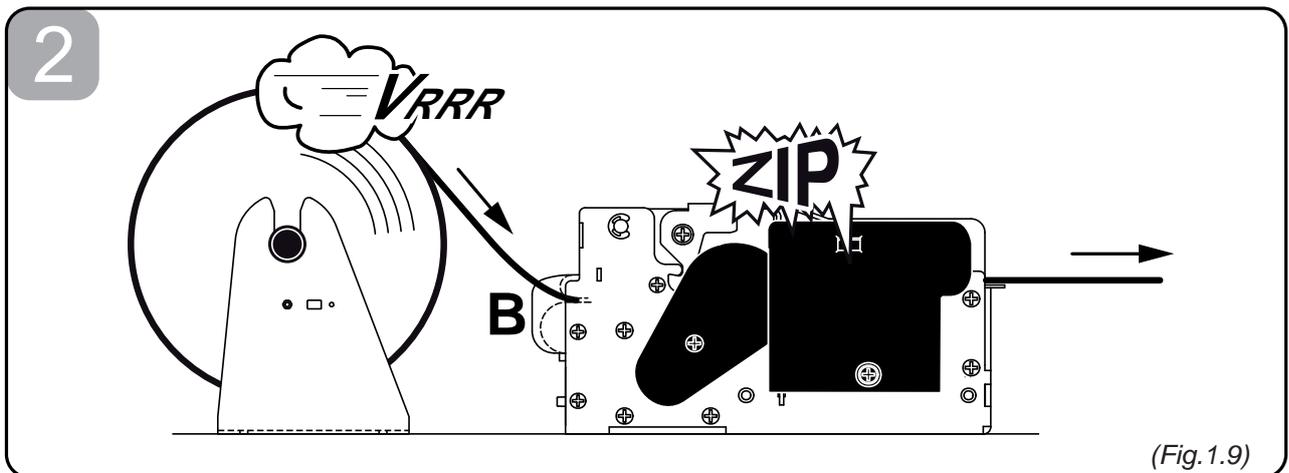
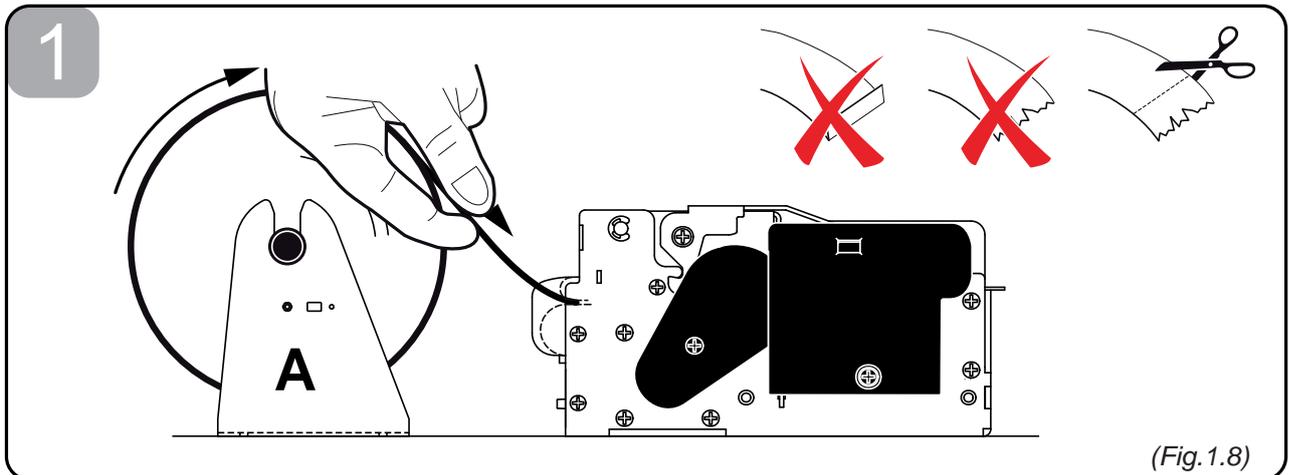
The roll must be perfectly aligned with the printer. The maximum play allowed is $\pm 1\%$.

2.6.2 Changing the paper roll

Every paper change verify that there aren't paper off-cuts from the paper inlet and outlet; if this event happens remove the paper off-cuts before execute any other operation.

To change the paper roll, proceed as follows:

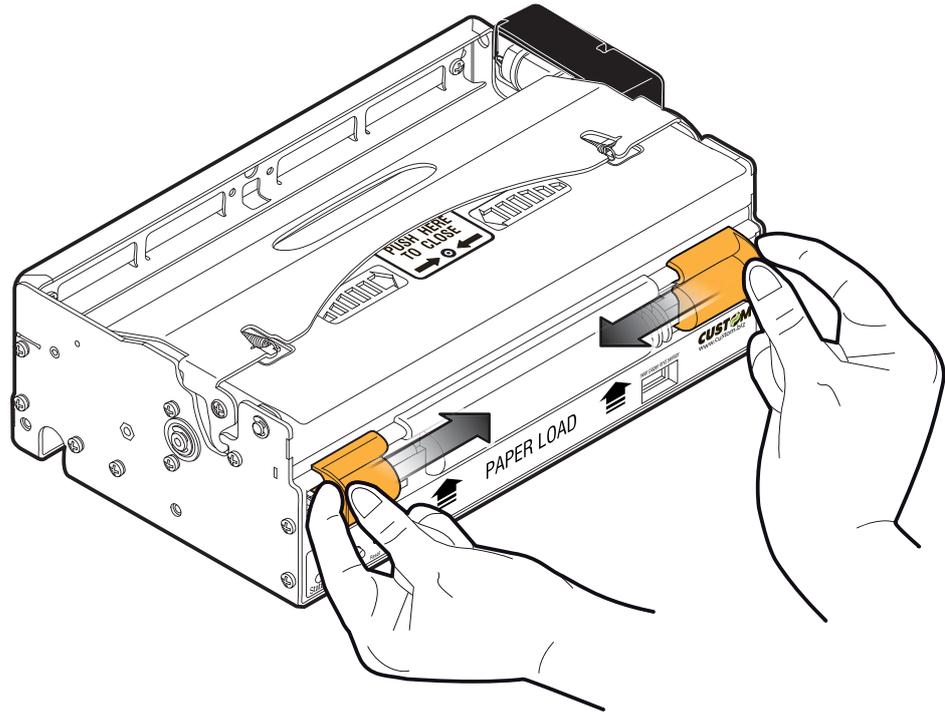
1. Position the paper roll (A) so that it unrolls correctly as shown (see fig. 1.8);
2. Insert the end of the paper roll in the paper load opening on the printing mechanism (B) and wait for the paper to load automatically (see fig. 1.9);
3. Remove the paper from the paper out (see fig. 1.10).



2. INSTALLAZION AND USE

2.6.3 Adjusting paper width

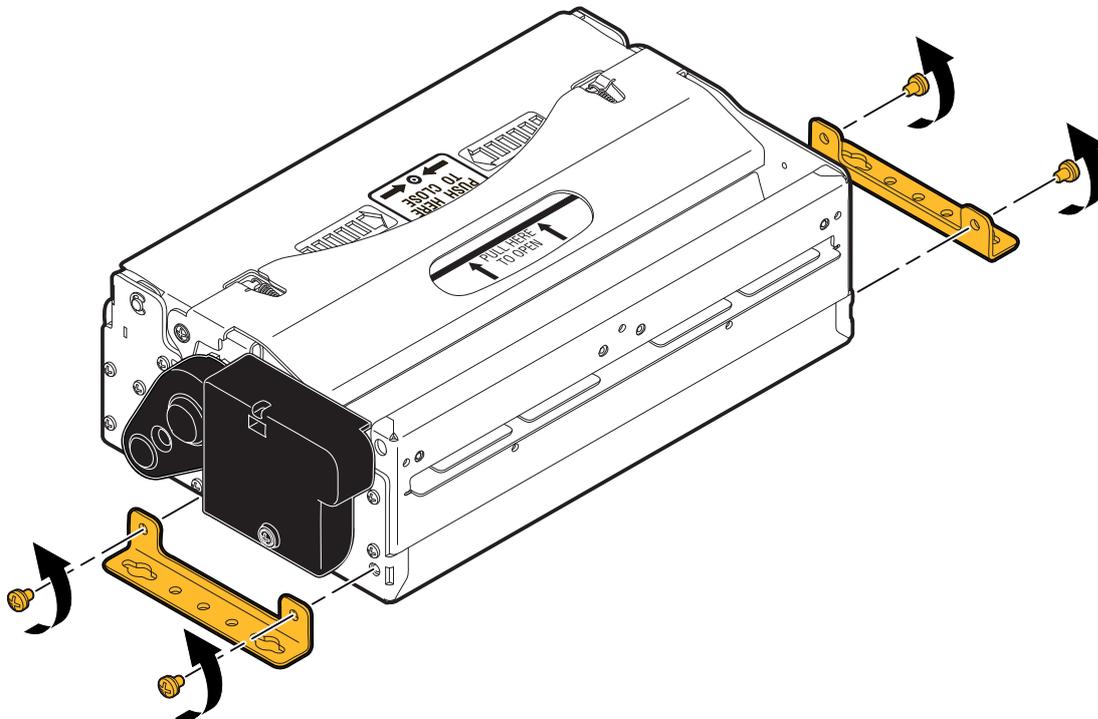
Paper width may be adjusted from 194mm to 216mm using the right (Dx) and Left (Sx) slides located at the paper infeed opening. Move the right and left slides to adjust the paper width (see Fig. 1.11).



(Fig. 1.11)

2.6.4 Additional brackets assembling

Packing with the printer are supplied two additional fixing brackets. Assemble the brackets to printer set as shown (see Fig. 1.12).



(Fig. 1.12)



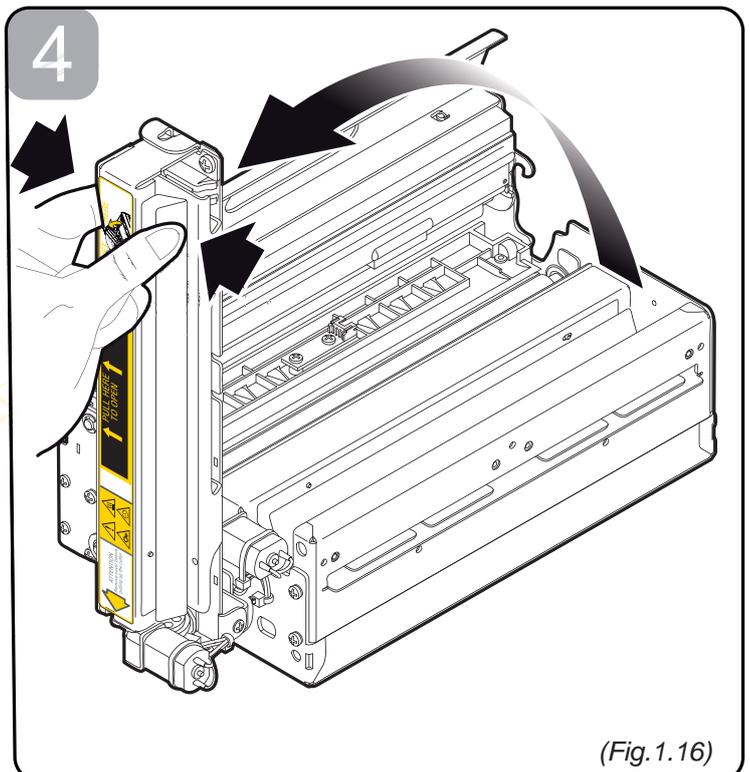
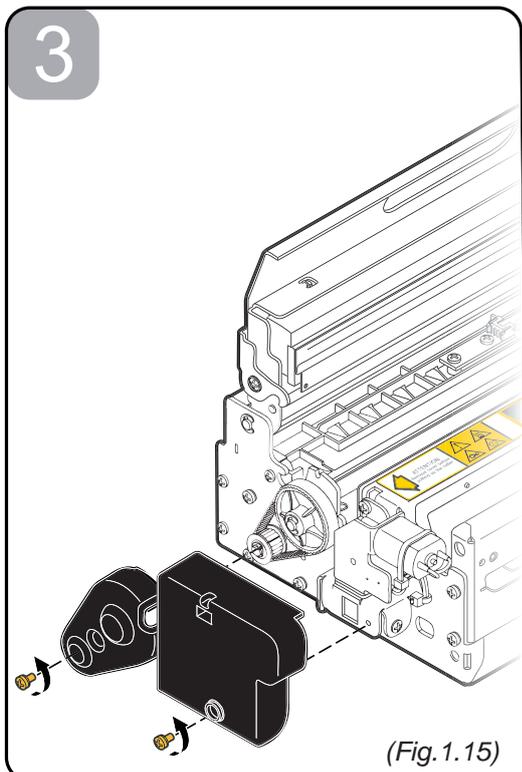
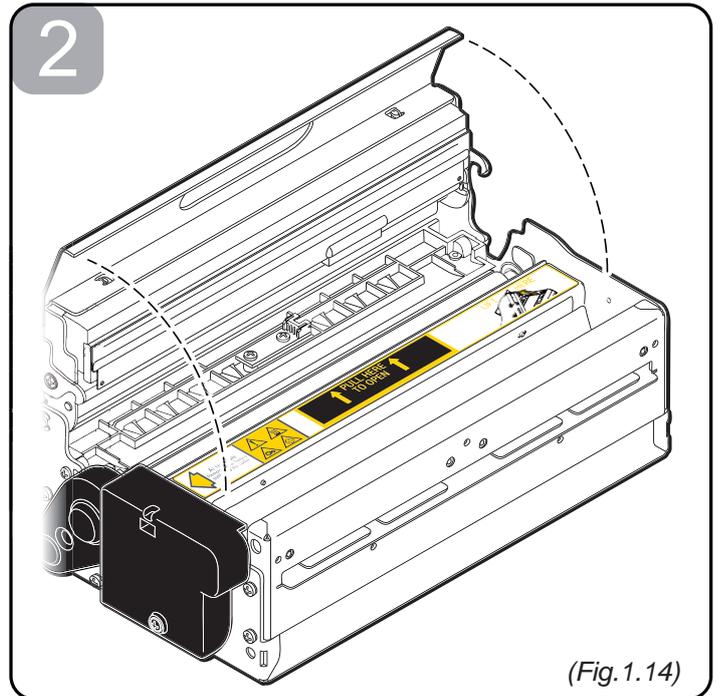
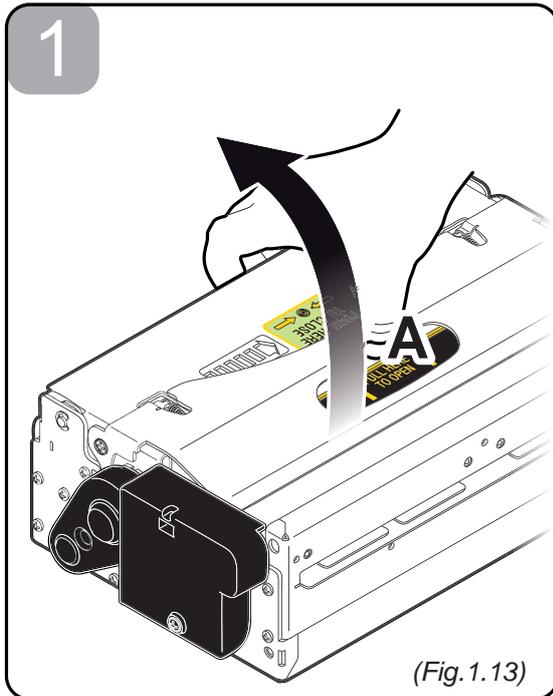
WARNING

For mounting position refer to the technical specifications (see Chapter 4).

2.6.5 Paper Jam

In the event of a jam along the paper path, proceed as follows. Turn the printer off and on, before removing the paper, in order to cut the paper and attempt to have it ejected. If this does not solve the problem, proceed as follows:

1. Lift up the print head using the opening slot (A) located on the cover (see Fig. 1.13)
2. Remove any pieces of paper.
3. Unscrew the 2 fixing screws and remove the lateral covers (see Fig. 1.15).
4. Pull the cutter as shown (see Fig. 1.16). Remove any pieces of paper.



2. INSTALLAZION AND USE

2.6.6 Cleaning the printing head

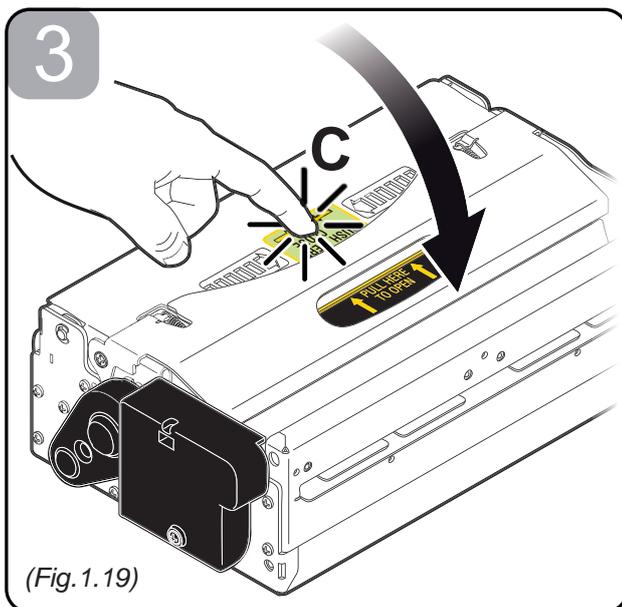
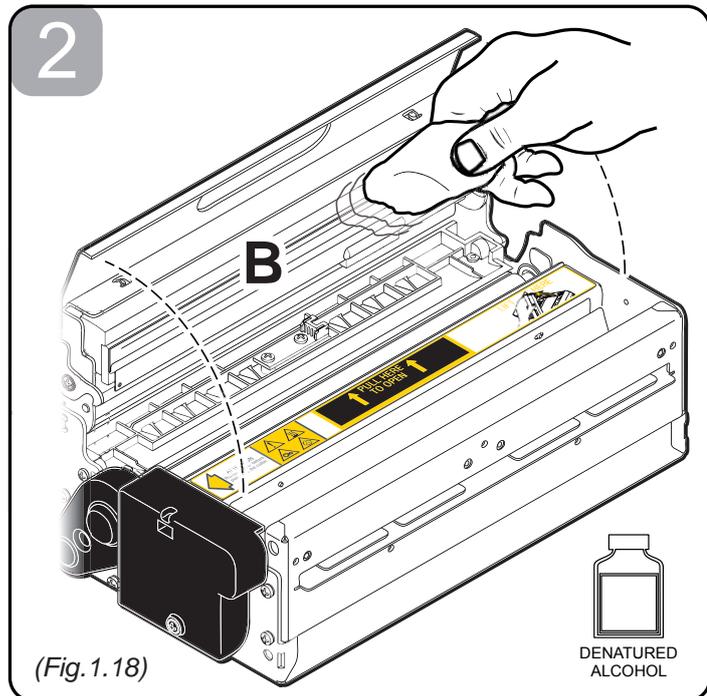
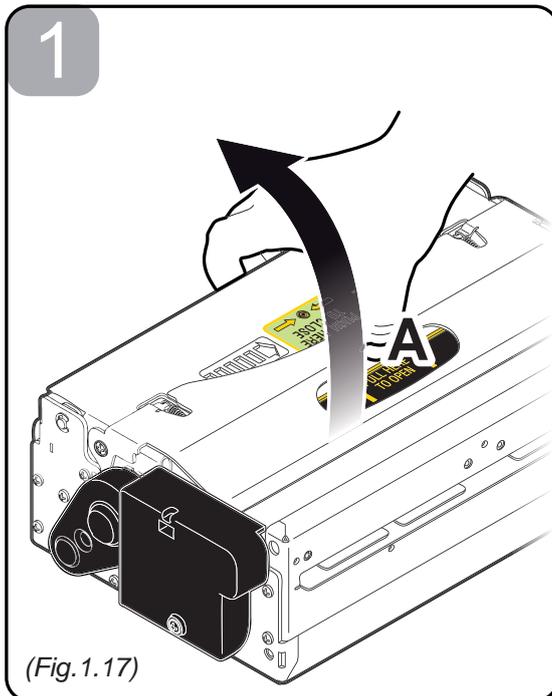


WARNING

- 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.
- The printer must be turned off when the printing head unit is removed.

Turn off the printer and proceed as follows:

1. Lift up the printing head using the opening slot (A) located on the cover, as shown (see Fig.1.17).
2. Clean the printing head heating line (B) using a non-abrasive cloth moistened with denatured alcohol (see Fig. 1.18)
3. Lower the cover to close and pressing (C) in the exact point indicated from the label located on the cover as shown (see Fig. 1.19).

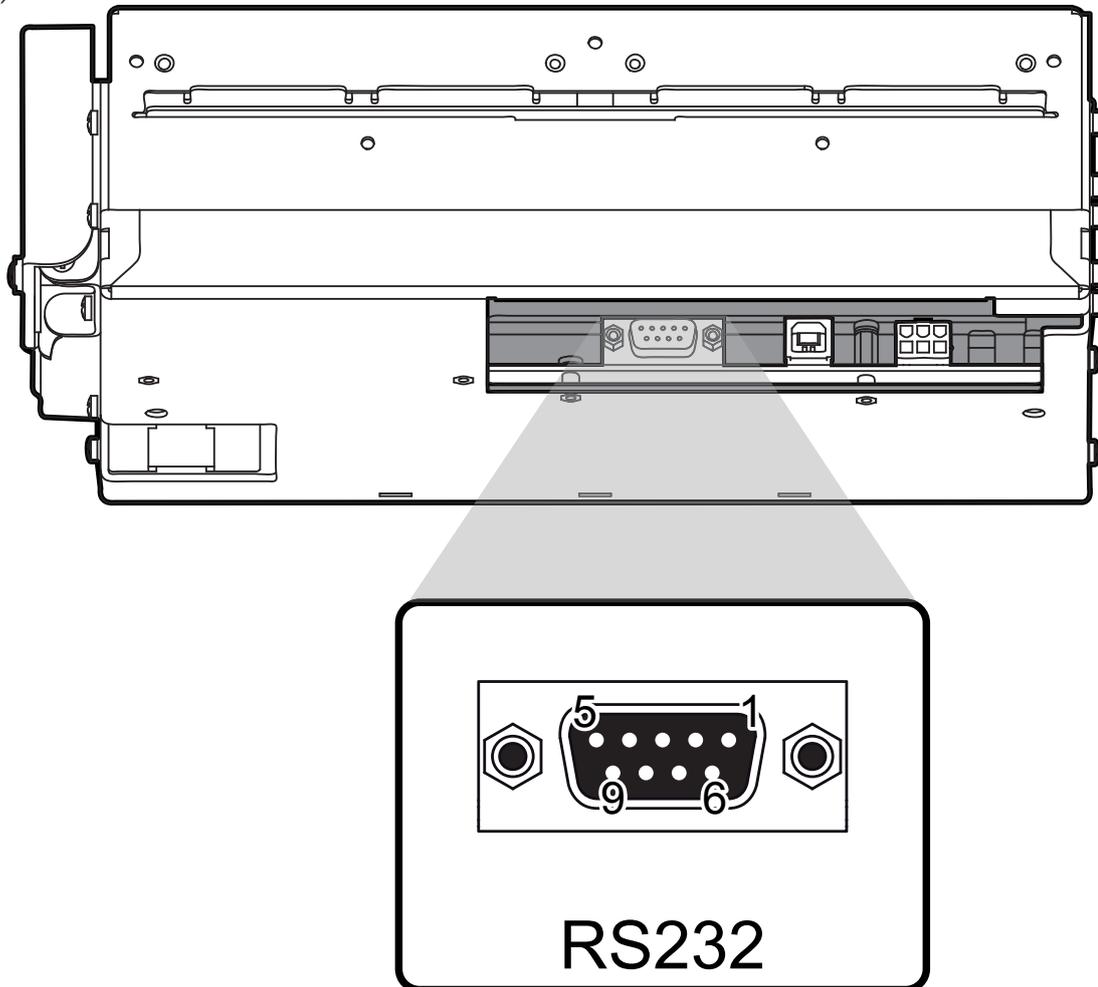


3 INTERFACE

3.1 RS232 serial interface

The printer has an RS232 serial interface and is connected by means of a 9 pin female connector (see Fig.3.1). In the following table, the signals present on the connector are listed:

(Fig.3.1)

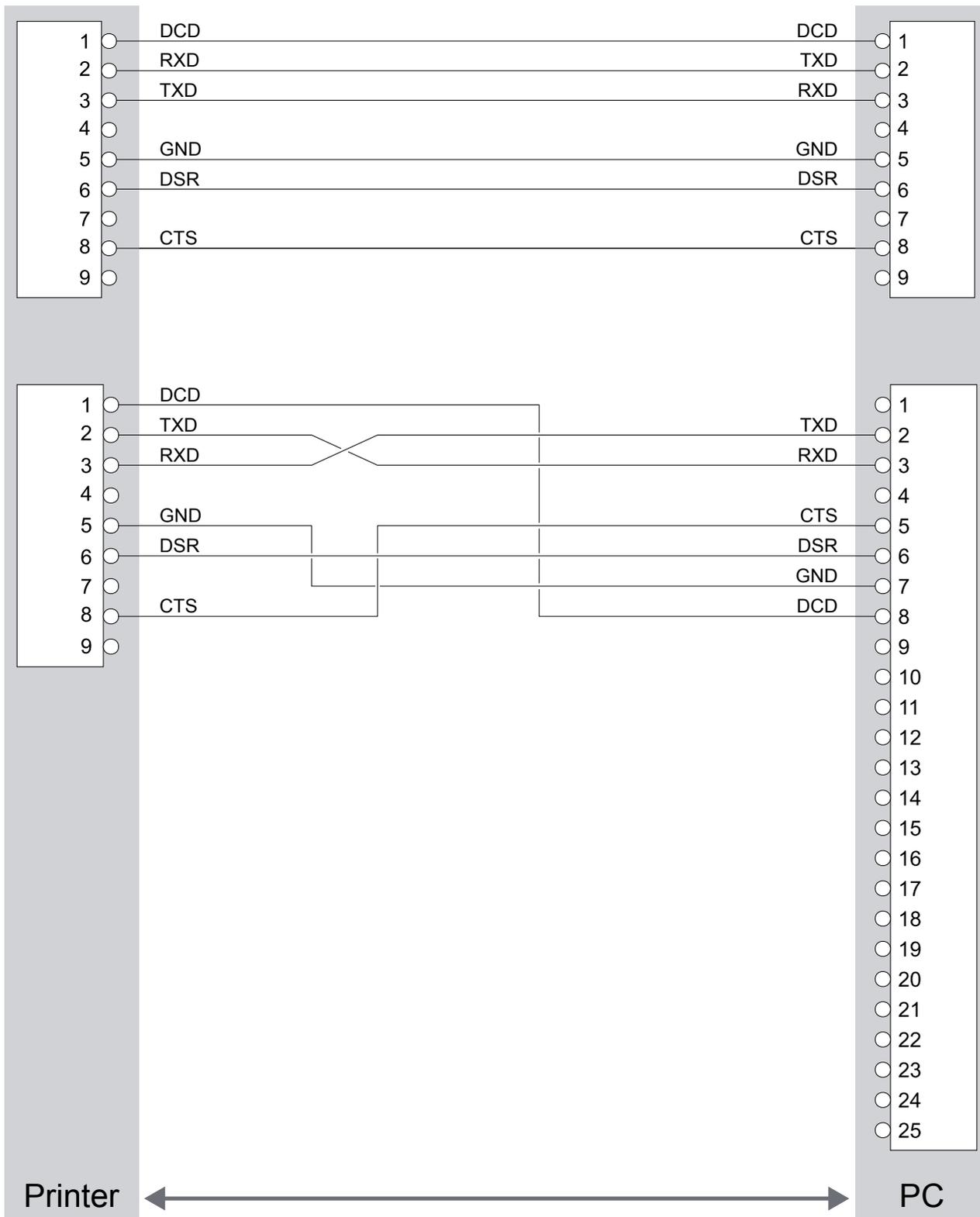


(Tab.3.1)

PIN	SIGNAL	IN / OUT	DESCRIPTION
1	DCD	OUT	Data Carrier detect. Printer ON (active at level RS232 high)
2	TXD	OUT	Transmit data. Serial output (from Host)
3	RXD	IN	Receive data. Serial data input (towards Host)
4	N.C.	-	Not connected
5	GND	-	Ground signal
6	DSR	OUT	Data Set Ready. Printer on and operating (active at RS232 level high)
7	N.C.	-	Not connected
8	RTS	OUT	Clear to send. Ready to receive data (active at RS232 high level)
9	N.C.	-	Not connected

3. INTERFACE

The following diagrams show examples of connections between the printer and the Personal Computer using 25 and 9 pin female connectors.



ATTENTION

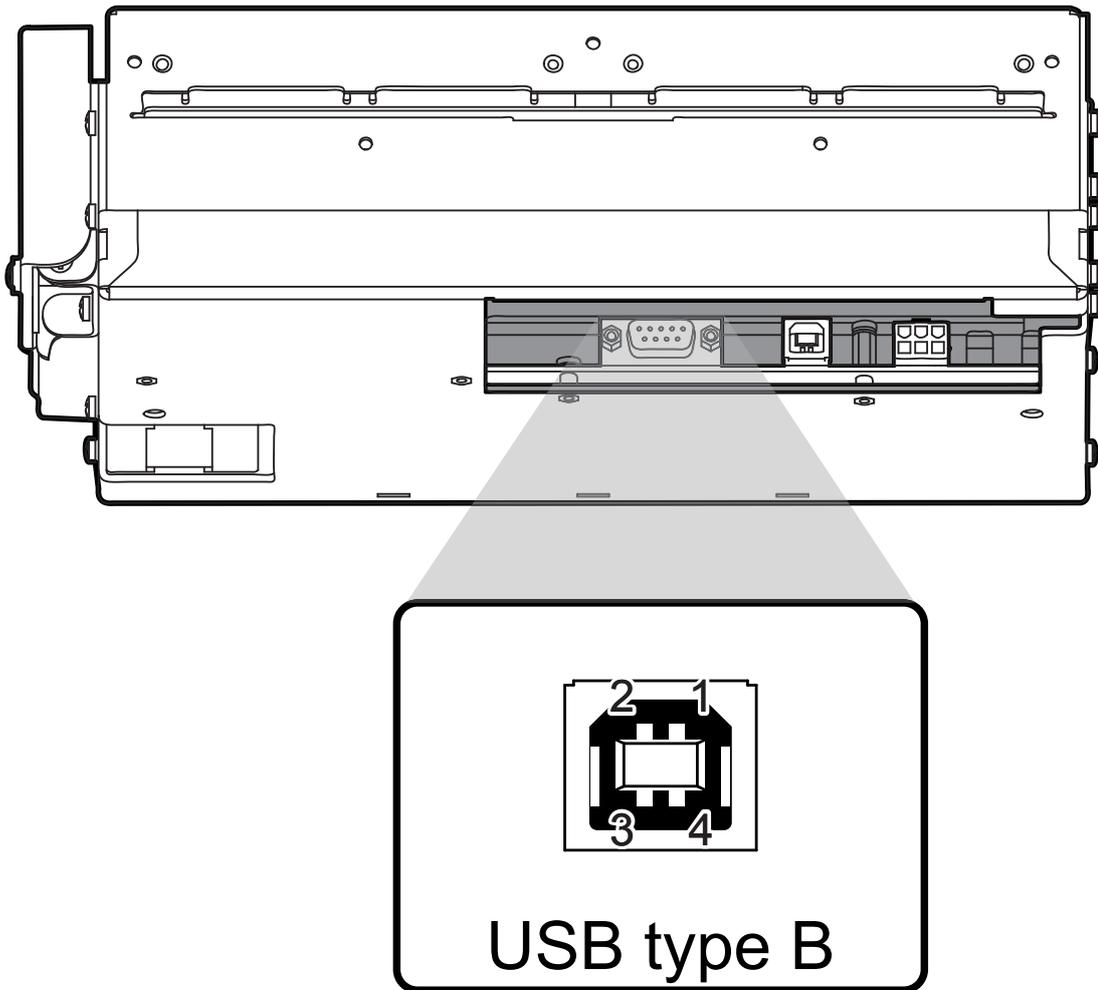
Using a serial cable it's better to install a ferrite at the end of the same cable.

3.2 USB Interface

The printer with USB interface complies to USB 1.1 specifications with the following specifications:

- Communication speed equal to 12 Mbit/sec.
- Type of connector "Receptacle series B".

Refer to the table below for the connector pin signals:



(Fig.3.2)

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



NOTE: If serial and USB connectors are inserted, communication port is USB

4 TECHNICAL SPECIFICATIONS

Table 4.1 gives the main technical specifications for the printer.

(Tab.4.1)

Available interfaces	Serial RS232	USB
Communication speed	From 1200 to 230400 bps	1.1
Sensors	Head temperature, paper in presence, notch sensor, paper out presence OPTIONAL: Near paper end (on paper roll holder support)	
Printing driver	Window™ 2K, XP, Vista, Linux	
Receive buffer	64 Kbytes	
Flash memory	16 Mbytes	
Emulation	ESC/POS™	
PRINTER SPECIFICATIONS		
Print method	Thermal, fixed head (8 dot/mm)	
Resolution	204 DPI (8 dot/mm)	
Printing speed⁽¹⁾	High Speed = 170 mm/sec Normal = 130 mm/sec High Quality = 95 mm/sec	
Printing mode	Normal, 90°, 180°, 270°	
Printing format	Normal, height / width from 1x to 8x, bold, reverse, underlined, italic	
Character fonts	PC437, PC850, PC860, PC863, PC865, PC858 (euro) Optional: GB2312 (Simplified Chinese font)	
Graphics memory	Logos dynamic management (max 2MB graphics memory)	
PAPER SPECIFICATIONS		
Type of paper	Thermal rolls (heat-sensitive side on outside of roll)	
Recommended types of paper	from 58 gr/m ² to 78 gr/m ² ± 5 gr/m ² (KANZAN KF50 and KP460, MITSUBISHI PG5075 and TL4000)	
Paper width	from 210 to 216 ± 0,5 mm	
Paper thickness	from 0,063 to 0,085 mm	
Core type	Cardboard or plastic	
Internal roll core diameter	Ø25 ± 1 mm (smooth without internal ridges)	
Paper end	Not attached to roll core	
ELECTRICAL SPECIFICATIONS		
Power Supply	24 Vdc ± 10%	
Absorptions		
Stand by	0.1 A	
Average ⁽¹⁾	2.5 A	
ENVIRONMENTAL CONDITIONS		
Operating temperature	0-50°C	
Relative humidity	10-85% Rh	
Storage temperature / Humidity	-20 °C – 70 °C / 10% - 90% Rh	

4. TECHNICAL SPECIFICATIONS

MECHANICAL SPECIFICATIONS	
Length	170 mm
Width	272 mm
Height	83.5 mm
Weight ⁽²⁾	3550 gr

(1) Standard CUSTOM receipt (L=10cm, Density = 12,5% dots on).

(2) Without paper roll.

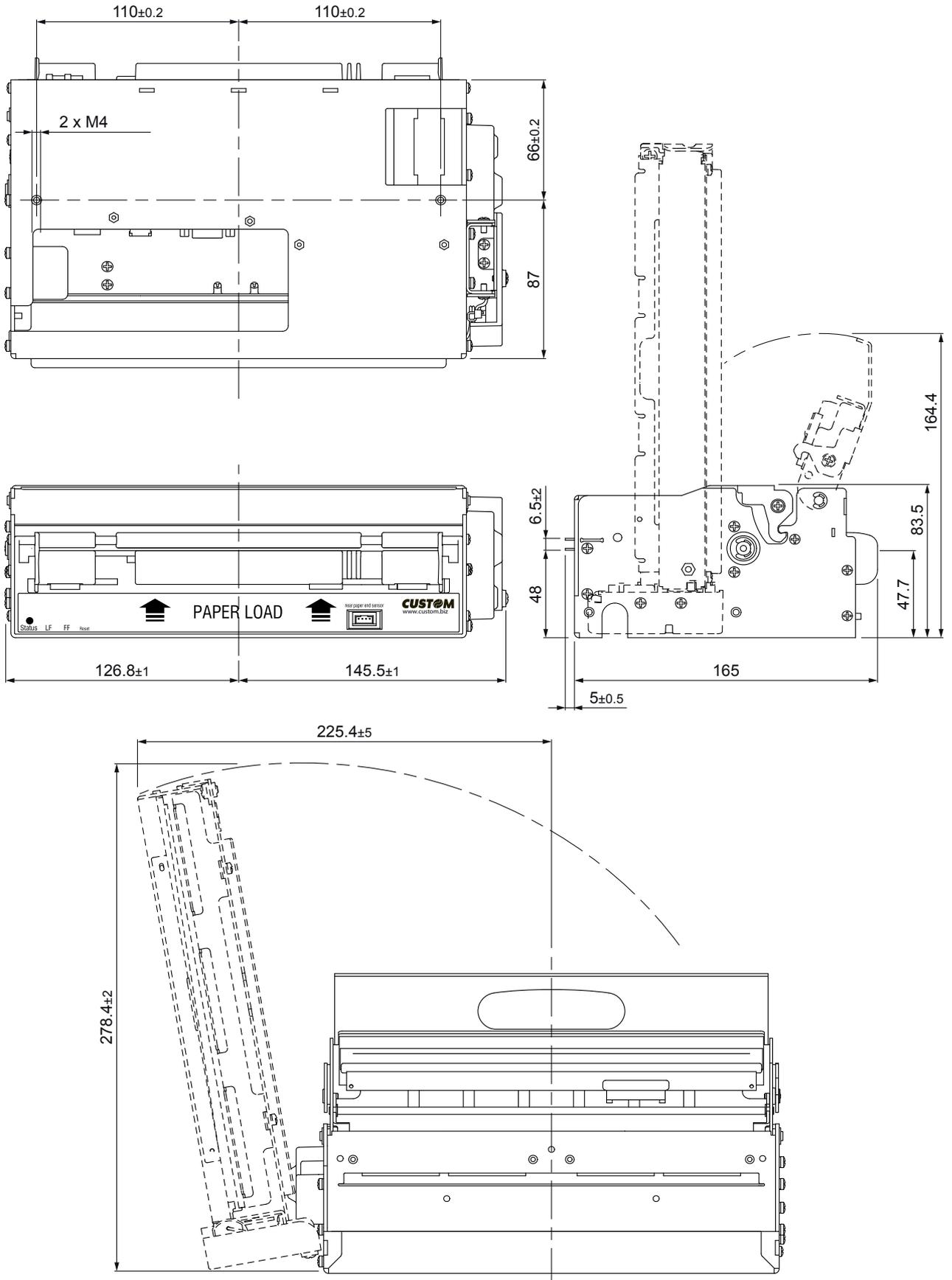
4.1 Character Specifications

(Tab.4.2)

ESC/POS™ EMULATION			
Character density	11 cpi	15 cpi	20 cpi
Number of columns	88	123	160
Printing speed			
Lines / sec	20	20	20
Characters / sec	1760	2480	3200
Character (W x H mm)			
Normal	2.25 x 3	1.625 x 3	1,25 x 3

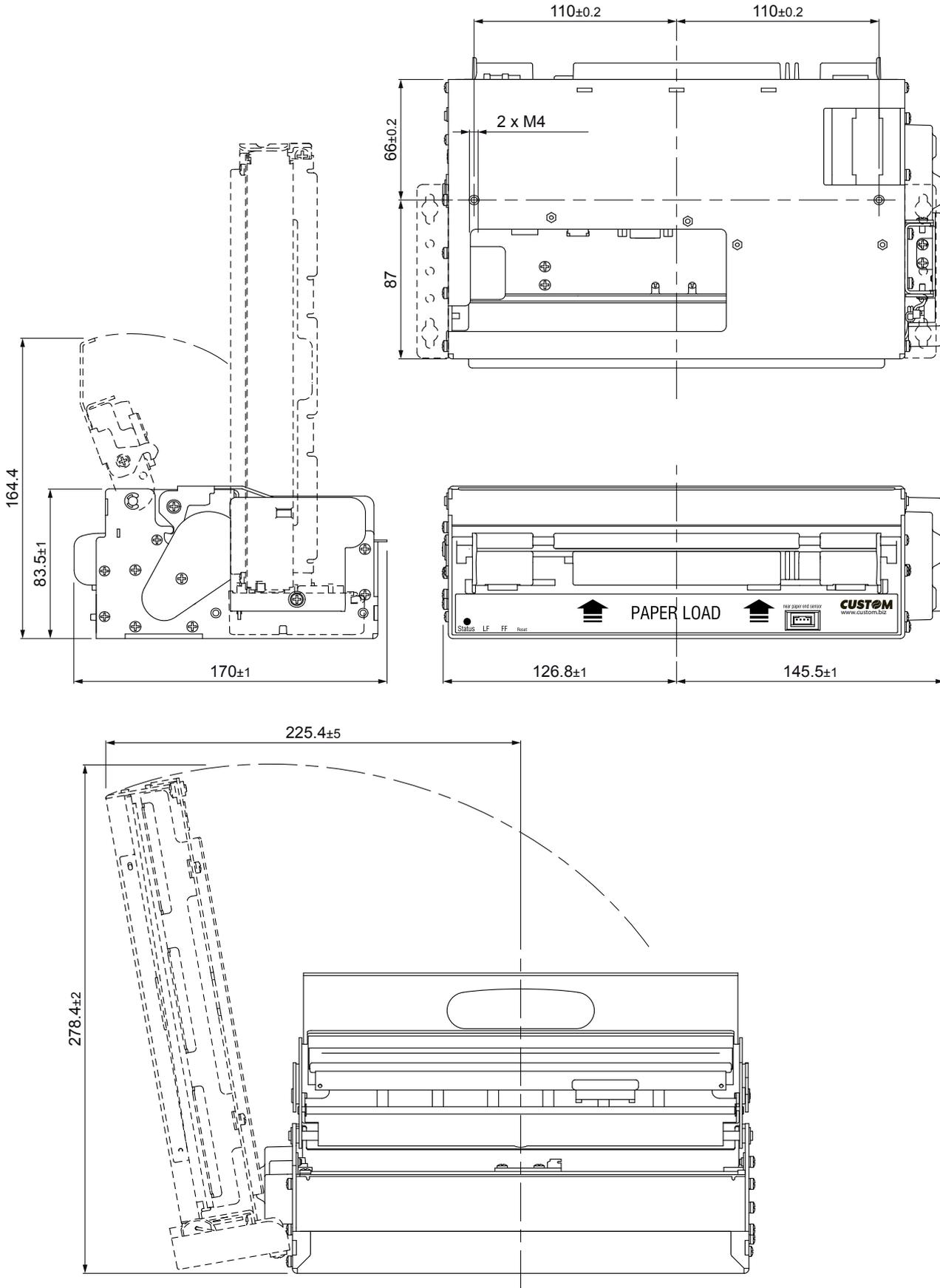
4.2 Dimensions

KM216H-U



4. TECHNICAL SPECIFICATIONS

KM216H-U-0146



4.3 Mounting position

KM216H-U

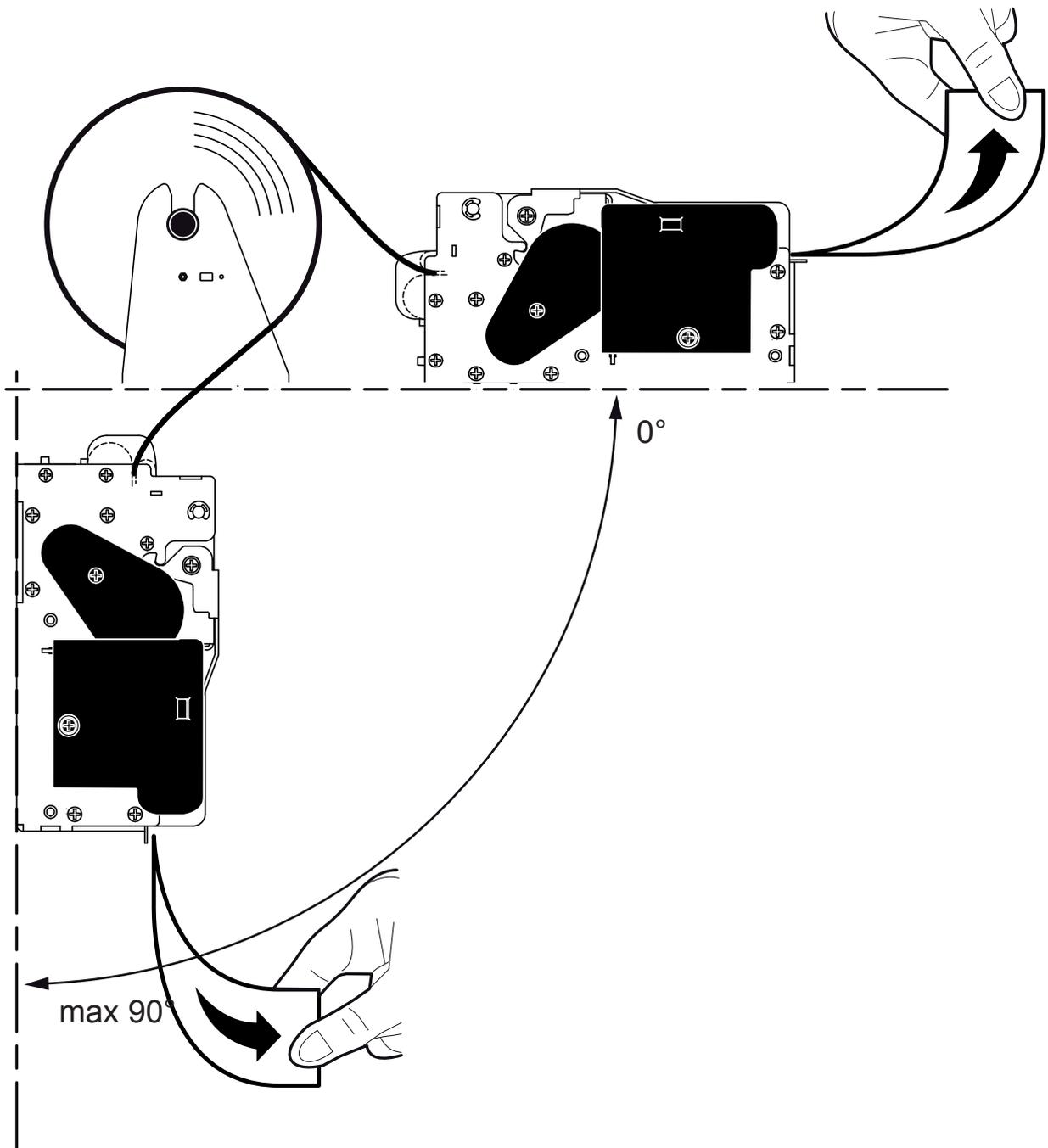
The printer is designed for the following positions (see Fig.4.1):

- Horizontal position (0°)
- Vertical position (90°)
- All the positions between horizontal and vertical positions



WARNING

Respect the mounting specifications to guarantee the right ticket emission.



(Fig.4.1)

4. TECHNICAL SPECIFICATIONS

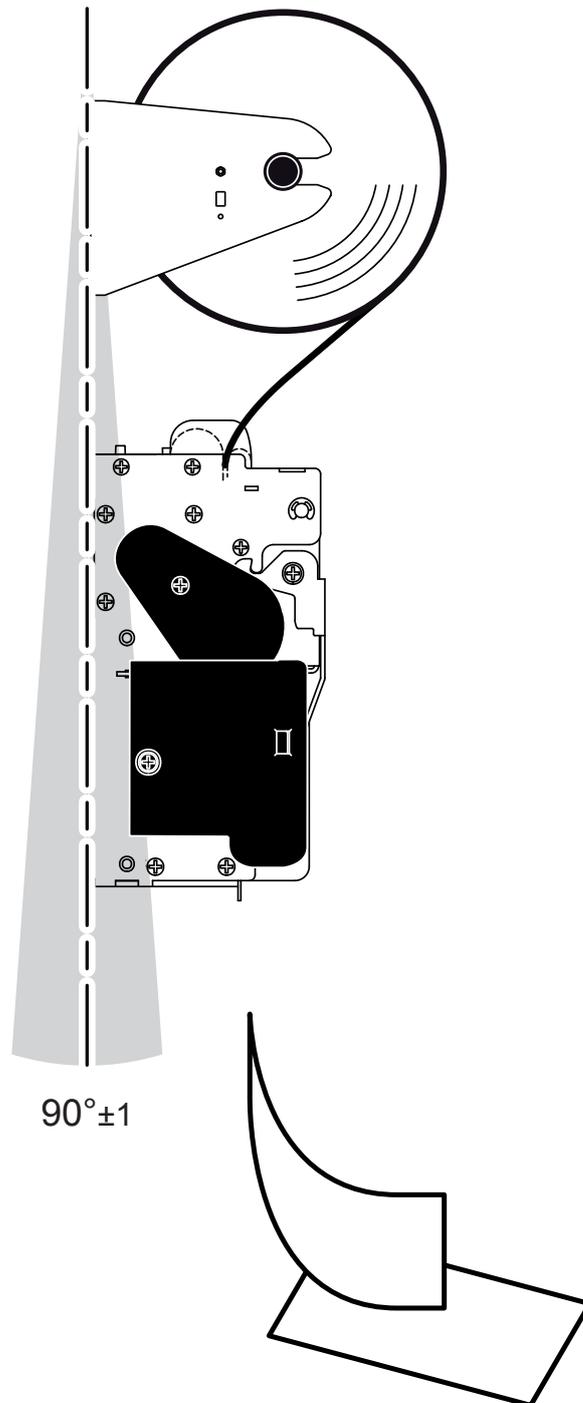
KM216H-U-0146

The printer is designed for vertical use only (90°) (see Fig.4.2).



WARNING

Respect the mounting specifications to guarantee the right ticket emission.
The ticket out must be downward.



(Fig.4.2)

With this version must be send two bytes to addressing characters: the first byte identifies the table, the second byte identifies the row and column in the table. In figure is reported an example of characters mapping; the x symbol identifies the character to address.

1° byte (n)

Range: $161 \leq n \leq 169$ (A1 ÷ A9),
 $176 \leq n \leq 247$ (B0 ÷ F7),

2° byte (m)

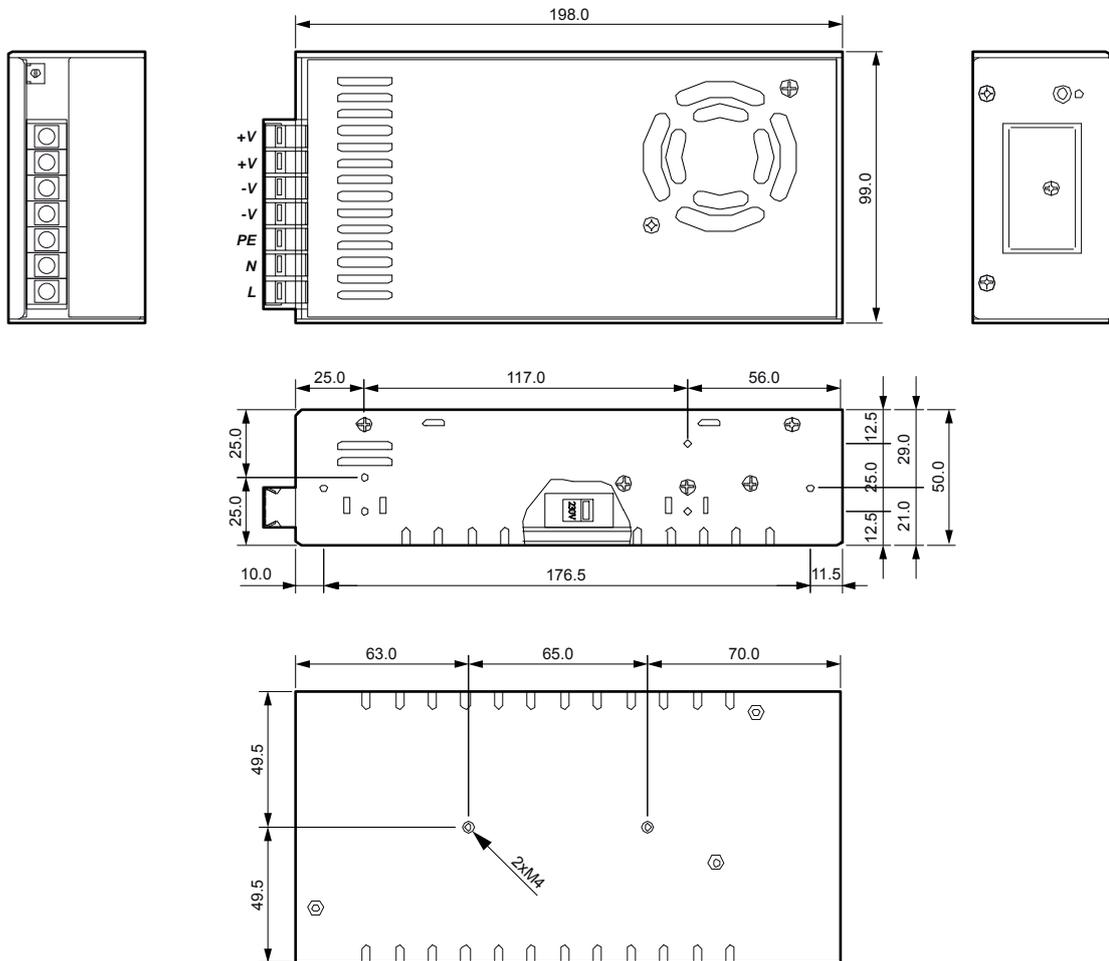
Range: $160 \leq m \leq 255$ (A0 , FF).

		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A1	A0																
	B0																
	C0																
	D0																
	E0									X							
	F0																
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A9	A0																
	B0																
	C0																
	D0																
	E0																
	F0																
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
B0	A0																
	B0																
	C0					X											
	D0																
	E0																
	F0																
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
F7	A0																
	B0																
	C0																
	D0																
	E0																
	F0																X

A.1 ACCESSORIES

A.1.1 Power supply

The figure below illustrates the power supply provided to be utilized for operating the printers:



(Fig.A.1)

PPSPS-240-P24	Switching power supply 24V 240W	
Input Specification	AC Input	115V ~ 5.0A 230V ~ 2.5A
	Input frequency	47Hz ÷ 63Hz
Output Specification	Output voltage	24V
	Output current	Max. 10A
	Efficiency	Typ. 83%
	Power	Max. 240W
Protection	Over Load	Over 105% ~ 180% of rating, recovers automatically after fault condition has been removed.
	Over Voltage	27.6 ~ 33.6V
	Short Circuit	Shutdown, recovers automatically after fault condition has been removed.
Environmental Condition	Operating temperature	0°C ÷ 50°C
	Humidity	10% ÷ 85% Rh (w/o condensation)
	Storage temperature / Humidity	-20°C ÷ +75°C / 10% ÷ 95% (w/o condensation)

APPENDIX A - ACCESSORIES AND SPARE PARTS

A.1.2 Connection cables



WRDATI-USB-MM-AB-18-BEI

AB type USB Cable (1,8 mt)



WRDATI-RS232-9-9-18-BEI

Serial cable with 9 pin male connector / 9 pin female connector (1,80 mt)

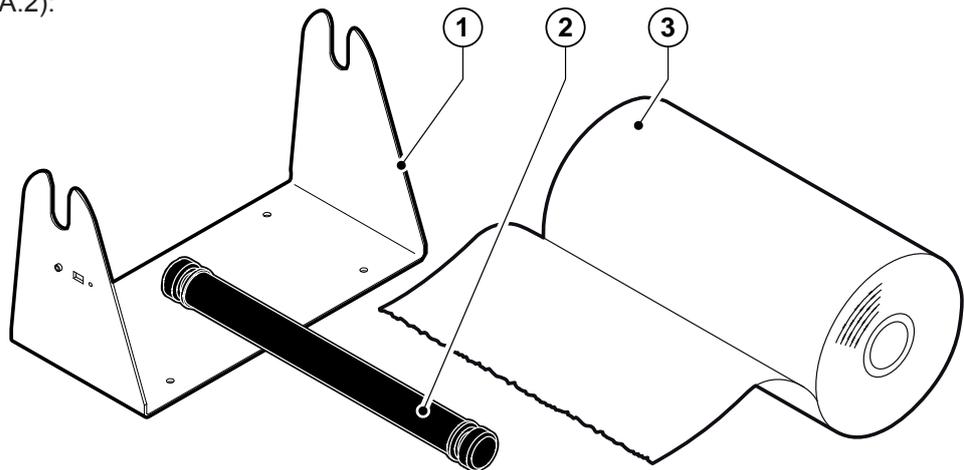
A.1.3 External paper roll holder

PMCM210-PEROT-25

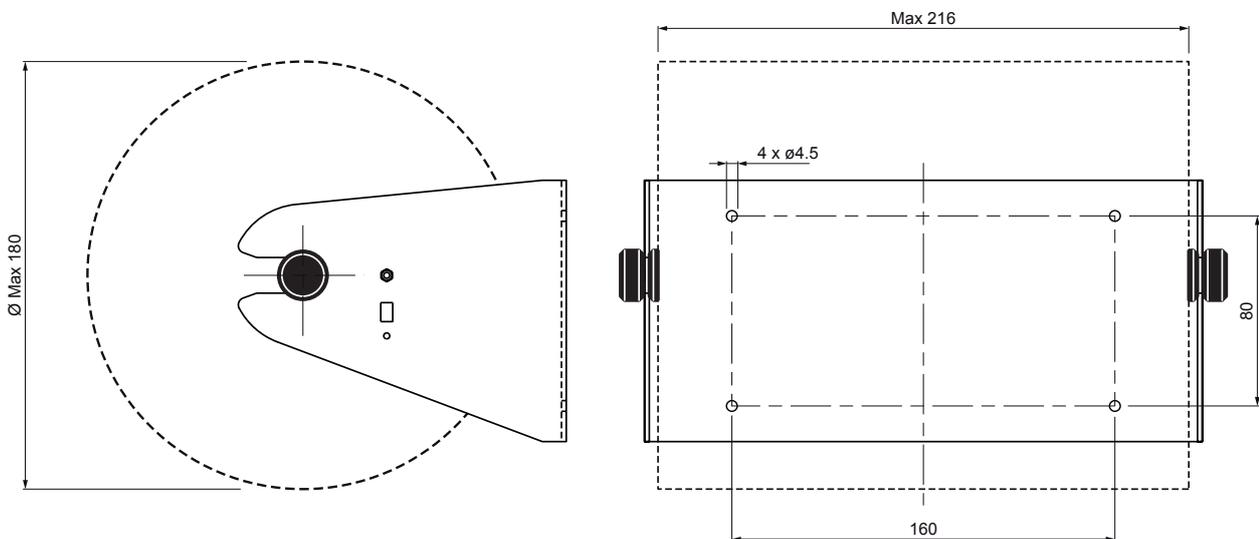
Paper roll holder kit

The kit includes (see Fig.A.2):

1. Paper holder support
2. Paper roll pin
3. Paper roll 210 d=140



(Fig.A.2)



(Fig.A.3)

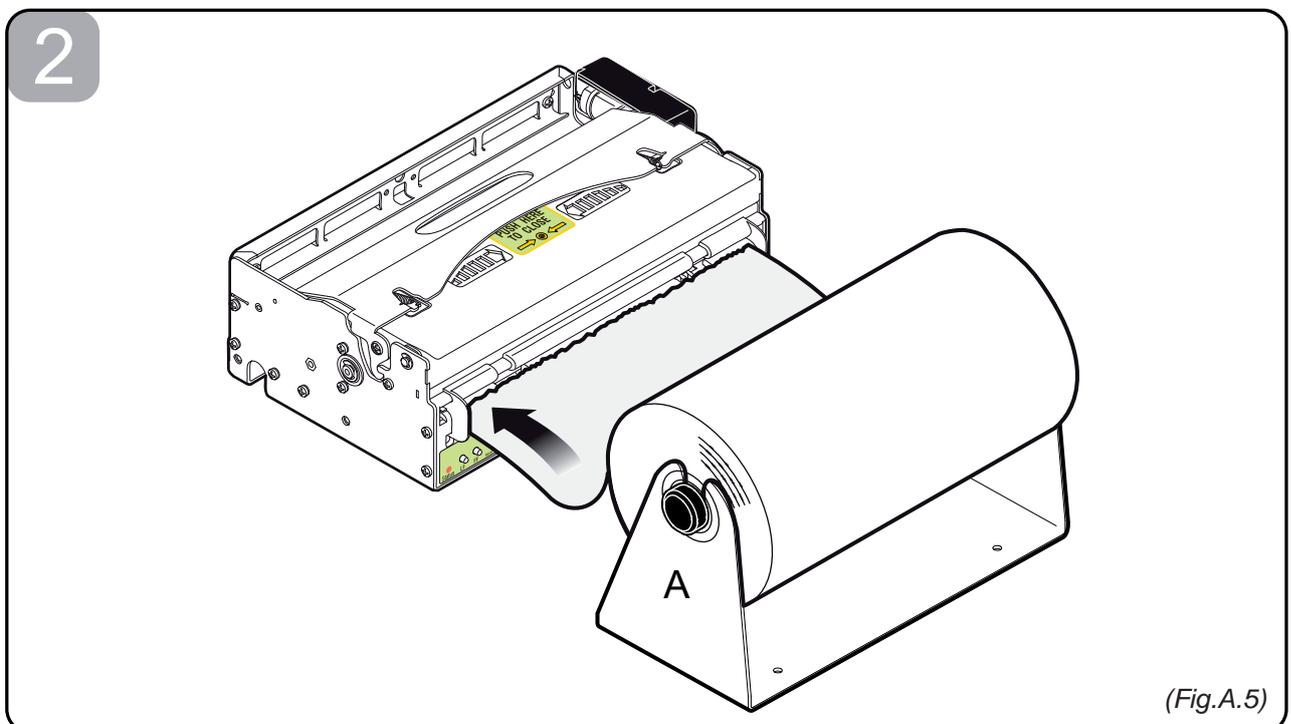
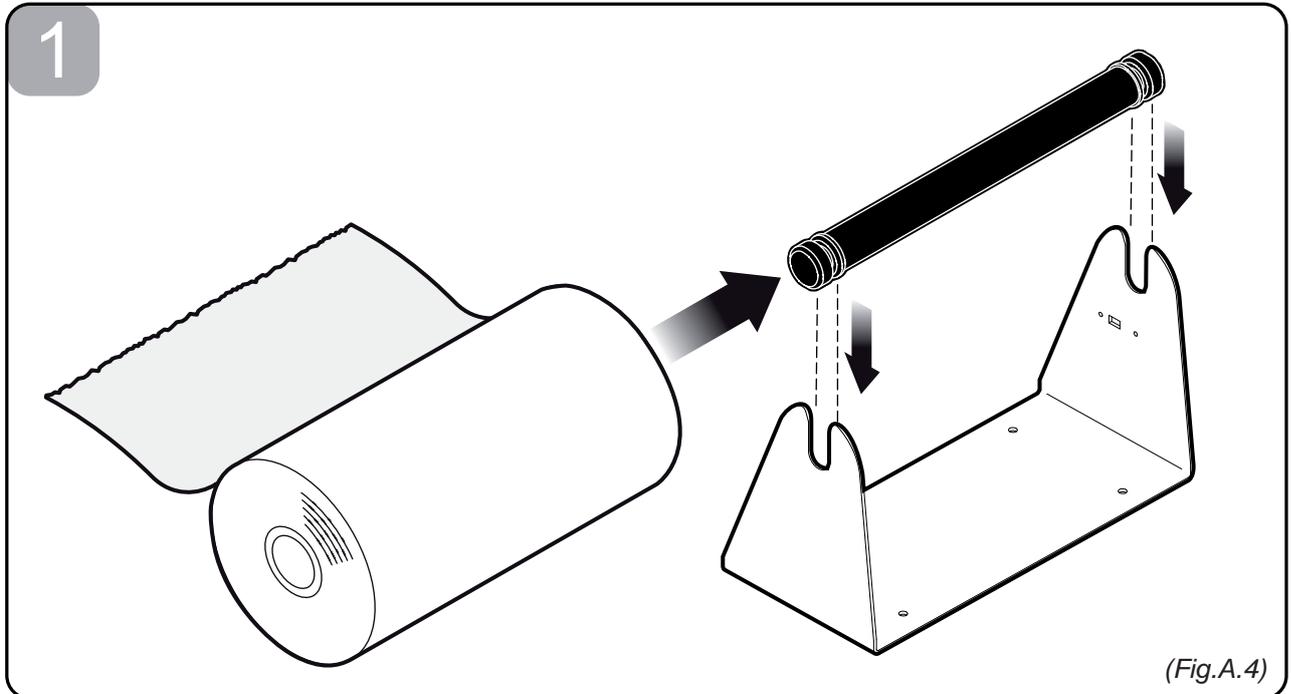
ASSEMBLY INSTRUCTION

To mount the external paper roll holder kit proceed as follows:

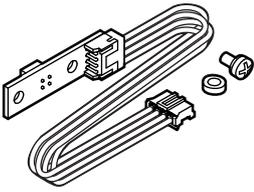
1. Insert the pin in the paper roll and put it on the support.
2. Place the paper roll holder behind the printer, with the side A (without holes) on the left.



NOTE: To load paper referred to the instructions indicated in par. 2.6 of this manual.
For external rolls diameter higher to 100mm it's recommended to use a paper pre tensioning device.



A.1.4 Near paper end kit

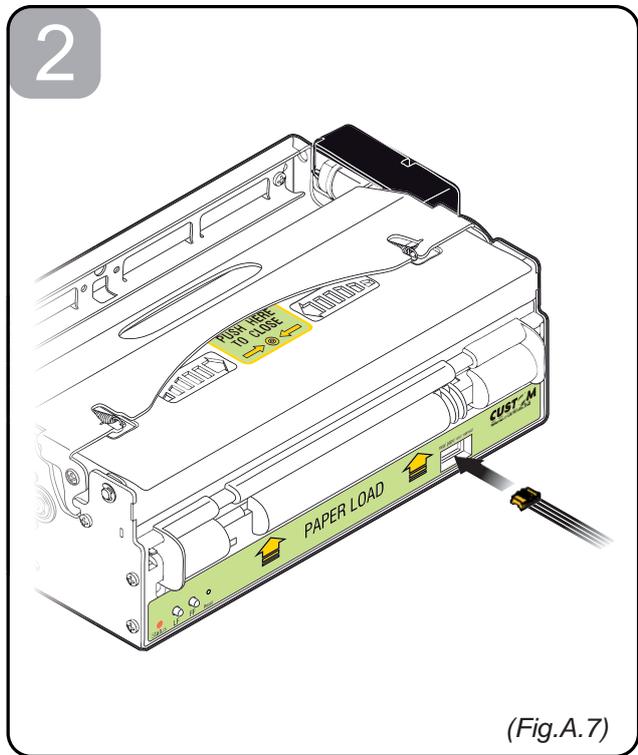
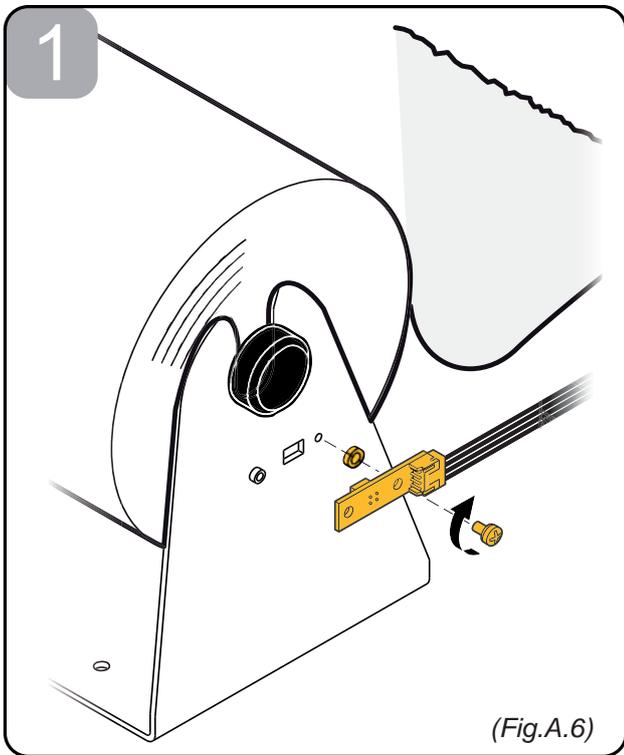


CBQFC2
Near Paper End for roll holder

ASSEMBLY INSTRUCTION

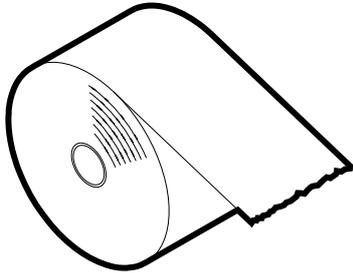
To mount the NPE for roll holder proceed as follows:

1. Fix the near paper end circuit as shown using the spacer and the screw.
2. Connect the near paper end cable with the printer.



A.2 SPARE PARTS

A.2.1 Supplies



RCT210X140-25MM-70GR

Thermal paper roll 210mm d=140 core 25mm

RCT210X180-25MM-70GR

Thermal paper roll 210mm d=180 core 25mm

RCT216X140-25MM-70GR

Thermal paper roll 216mm d=140 core 25mm

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.

To guarantee the alignment it is necessary that the “*Notch Alignment*” 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.

B.1.2 Enabling, calibrating and setting of parameters

The notch sensor is a reflection sensor that emits a band of light and detects the quantity of light reflected to it.

The presence of the notch is therefore detected by the amount of light that returns to the sensor, taking into account that the light is reflected by the white paper and absorbed by the black.

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 Alignment*” parameter will have to be enabled from the printer setup (see setting configuration parameters):

Notch Alignment : **Enabled**

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 : **22%**

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 notch 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.

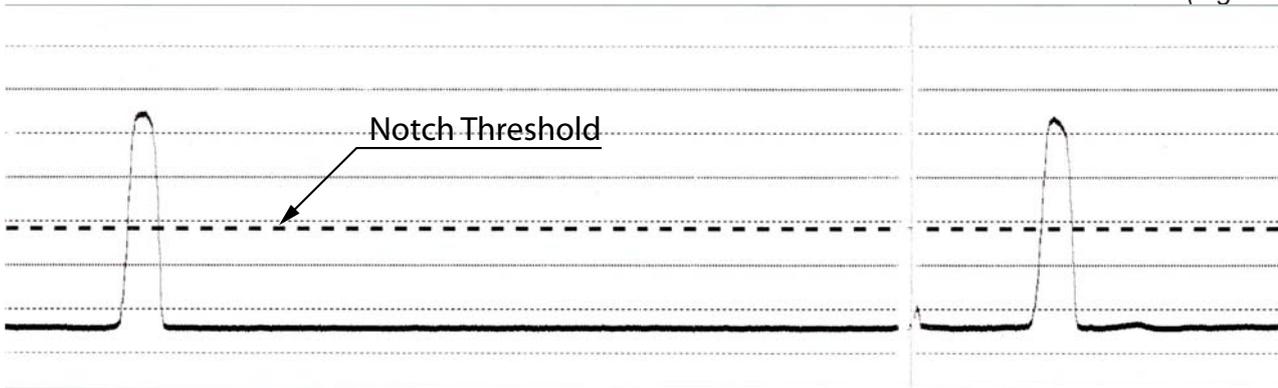
In order to better identify the optimum threshold for the paper being used, a paper characterization function is also available in setup.

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)



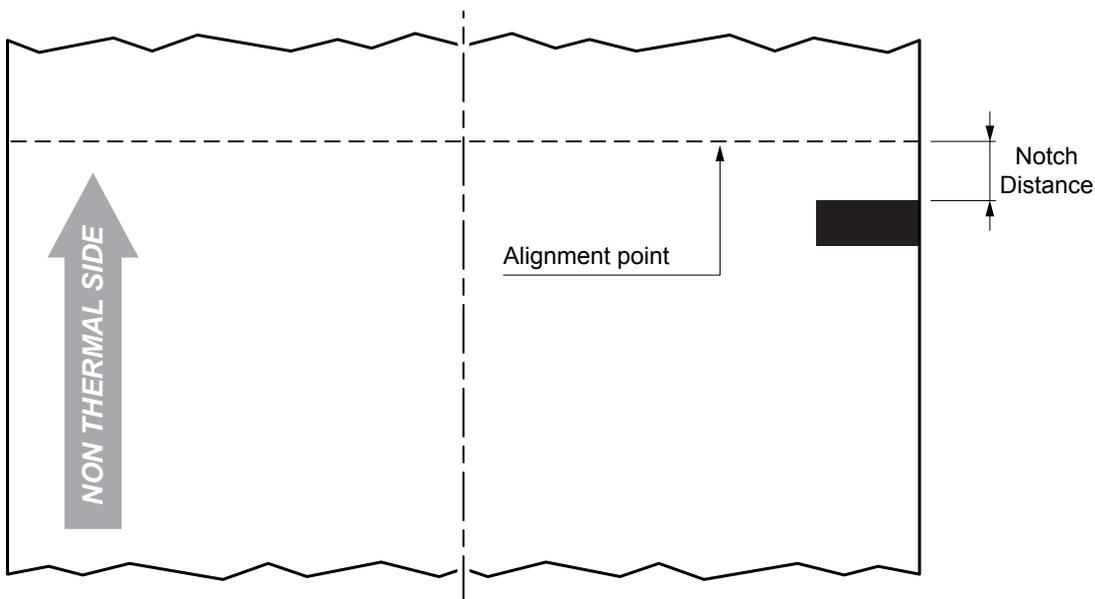
NOTE: The outgoing voltage of the sensor will be presented in a graphic as a percentage value.

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 ; 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 -20mm (negative value) and a maximum of 24 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.

B.2 COMMANDS

B.2.1 Ticket alignment

In ESC/POS™ emulation the two alignment available commands are : **\$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 ticket start.

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 of the next ticket, so that a subsequent cut will occur precisely at the end of the ticket. Further explanations can be found in the command reference 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.

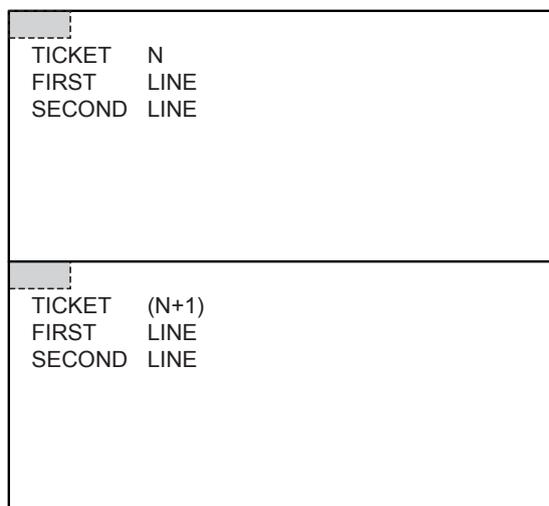
B.2.3 Examples



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 with 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):

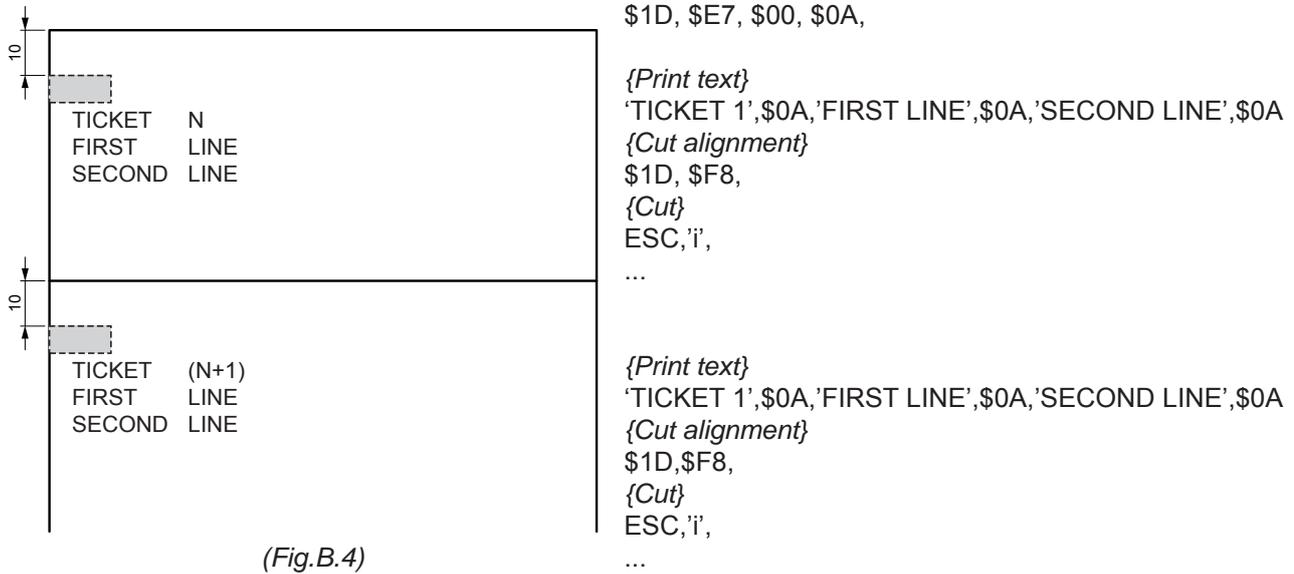


(Fig.B.3)

APPENDIX B - ALIGNMENT MANAGEMENT

Example 2

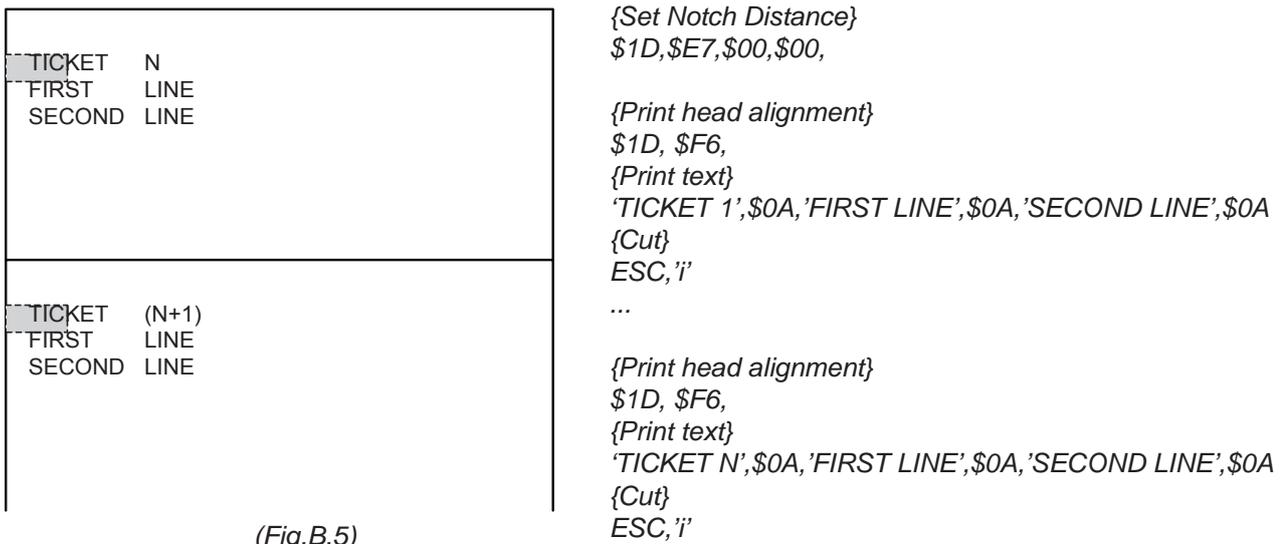
To cut 10mm before the notch the command sequence is (this setting have effect after the ticket already in the printer):



(Fig.B.4)

Example 3

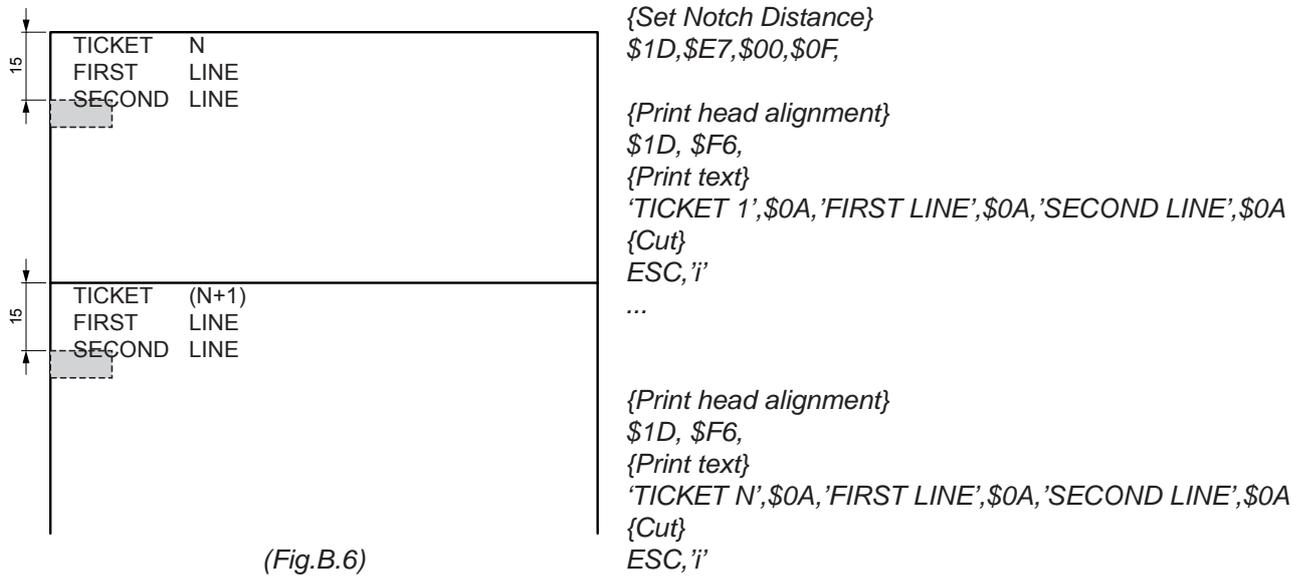
To print over the notch the command sequence is (this setting have effect after the ticket already in the printer):



(Fig.B.5)

Example 4

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



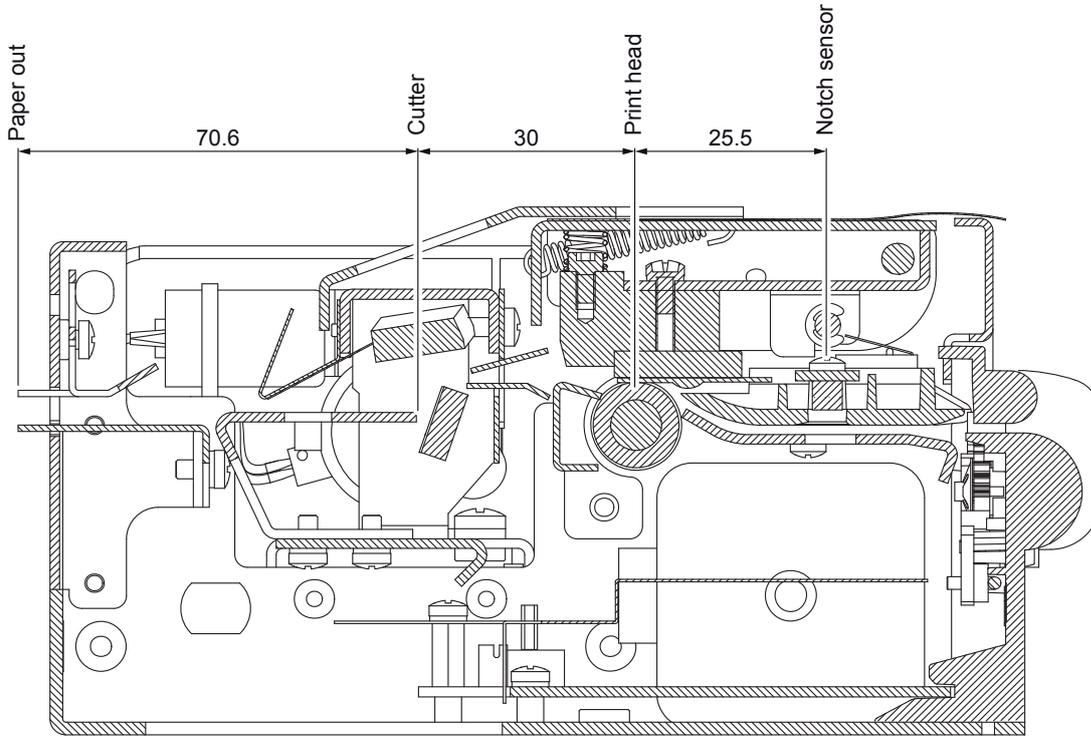
(Fig.B.6)

B.3 PRINTER MECHANICAL CHARACTERISTICS

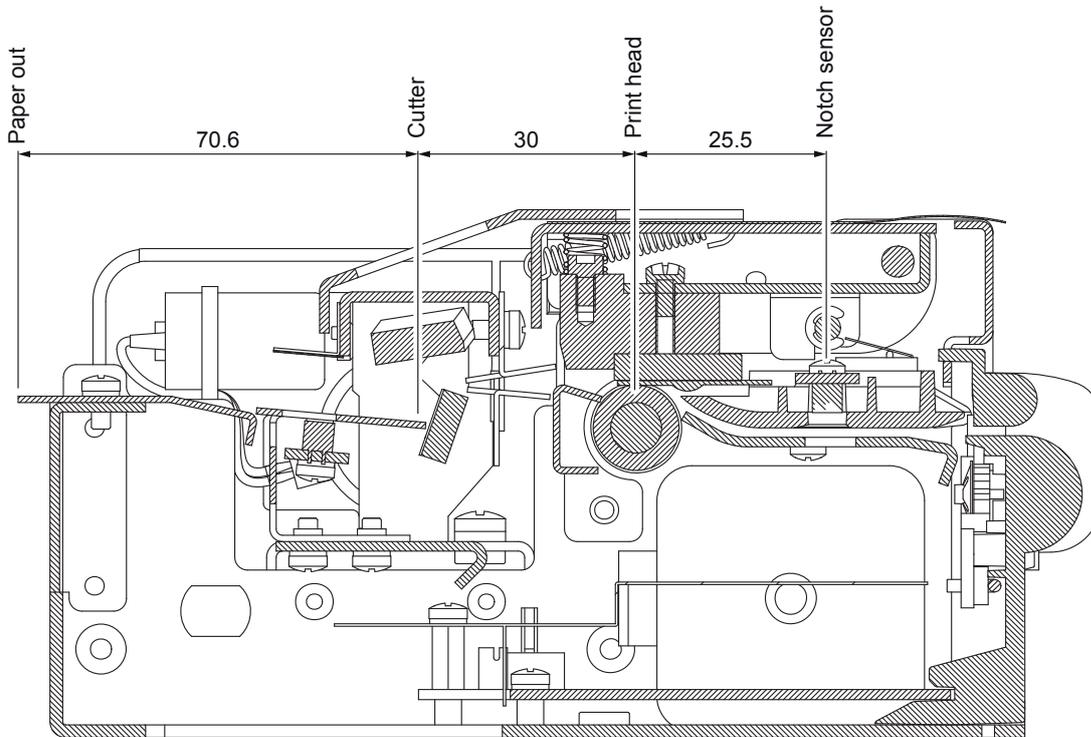
B.3.1 Position of sensors

Figure B.7 shows a section of the printer and the distances between the head, the cutter, the notch sensor, the paper out.

(Fig.B.7)



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B.3.2 Ticket Dimension

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:

$$\text{INTER-NOTCH DISTANCE} > \text{PRINTED AREA HEIGHT}$$

where

INTER-NOTCH DISTANCE = the distance between two notch edges

The picture in figure B.8 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.

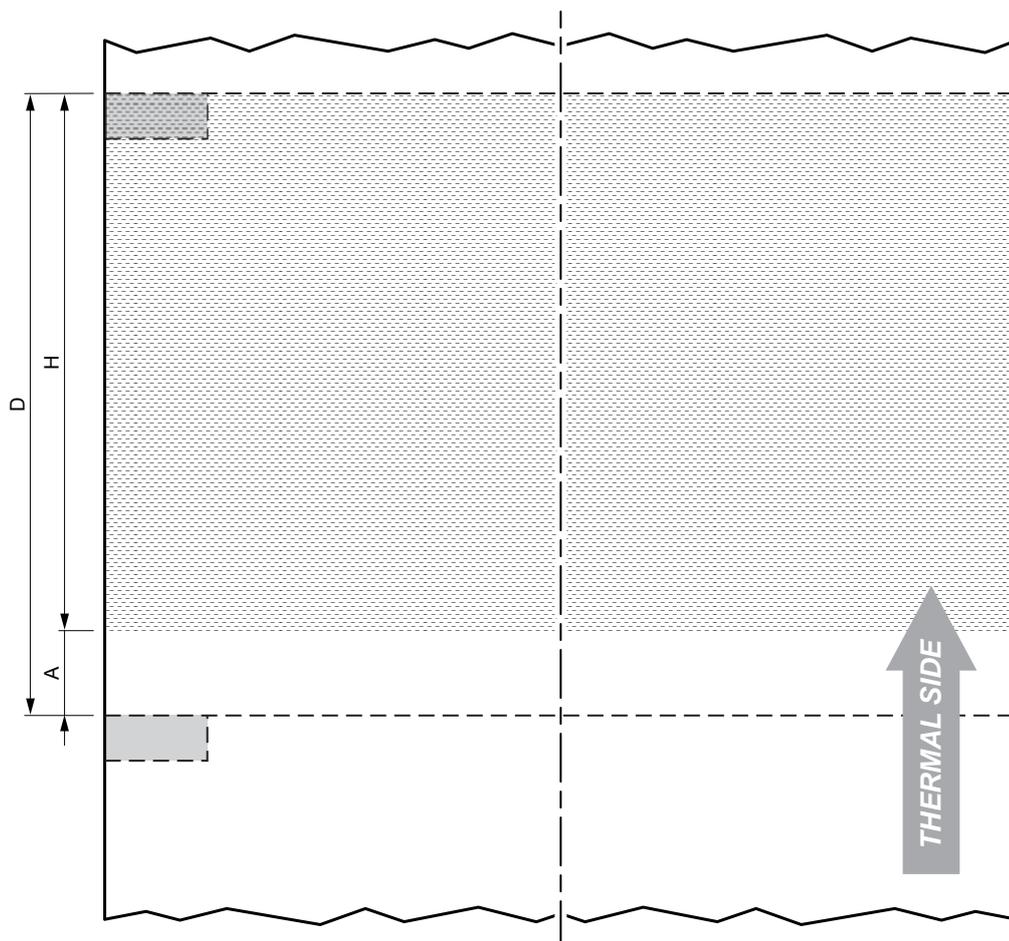
LEGEND:

A = Alignment feed

H = Printing area height

D = Inter-notch distance

(Fig.B.8)



NOTE: In ESC/POS™ emulation to prevent any jamming, after cut, the paper is not completely recovered, but it remains outside the printing line of 10mm; so it's very important to consider this distance, in this emulation, during the ticket layout definition.

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,
- 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 command.

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: \$1D \$F8.
5. Cut command.

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



NOTE: This method of alignment represents the right functioning way.

