![Carl Valentin Drucksysteme logo: CV valentin DRUCKSYSTEME]

SPECTRA
Service Instructions

Quality . Tradition . Innovation

Trademarks

All named brands or trademarks are registered brands or registered trademarks of their respective owners and may not be separately labelled. It must not be concluded from the missing labelling that it is not a registered brand or a registered trademark.

Carl Valentin label printers comply with the following safety guidelines:

CE   EG Low-Voltage Directive (73/23/EEC)
EG Electromagnetic Compatibility Directive (89/336/EEC)

Table of Contents

1   Notes on this Document

1.1   User Notes

This service manual is intended for qualified service and maintenance staff.

This manual contains information about the electronics and the mechanical part of the printing system.

Information about operation of printer can be taken from our operating manual.

If a problem arises that cannot be solved with help of this service of manual, then please contact your responsible dealer.

1.2   Instructions

Basic information and warning references with the corresponding signal words for the danger level are as follows specified in this manual:

DANGER identifies an extraordinarily great and immediate danger which could lead to serious injury or even death.

WARNING identifies a possible danger would could lead to serious bodily injury or even death if sufficient precautions are not taken.

WARNING of cutting injuries.
Pay attention that cutting injuries caused by blades, cutting devices or sharp-edged parts are avoided.

WARNING of hand injuries.
Pay attention that hand injuries caused by closing mechanical parts of a machine/equipment are avoided.

WARNING of hot surfaces.
Pay attention so as not to come into contact with hot surfaces.

CAUTION indicates a potentially dangerous situation which could lead to moderate or light bodily injury or damage to property.

NOTICE gives you tips. They make a working sequence easier or draw attention to important working processes.

Gives you tips on protecting the environment.

$\Rightarrow$ Handling instruction

✽   Optional accessories, special fittings

Date   Information in the display

1.3   Cross References

Drawings

References to specific items in a figure are marked with letters. They are identified with parentheses in the text, e.g. (A). If no figure number is provided, letters in the text always refer to the graphic directly above the text. If a reference is made to another graphic, the figure number is specified, e.g. (A, in figure 5).

Cross references to chapters and sections

For a cross reference to chapters and sections, the chapter number and page number are specified, e.g. a reference to this section: see chapter 1.3.2, page 35).

References to other documents

References to other documents have the following form: See *'operating manual'*.

2 Safety Instructions

2.1 General Safety Instructions

Workplace and method of working

$\Longrightarrow$ Keep the area around the device clean during and after maintenance.

$\Longrightarrow$ Work in a safety-conscious manner.

$\Longrightarrow$ Store dismantled device parts in a safe place while maintenance is being performed.

Clothing

> ！ **CAUTION!**
>
> The drawing in of items of clothing by moving parts can lead to injuries.
>
> $\Longrightarrow$ If possible, do not wear clothing which could be caught by moving device parts.
>
> $\Longrightarrow$ Button or roll up shirt or jacket sleeves.
>
> $\Longrightarrow$ Tie or pin up long hair.
>
> $\Longrightarrow$ Tuck the ends of scarves, ties and shawls into your clothing or secure them with non-conductive clips.

DANGER!

Risk of death from increased flow of current via metals parts which come into contact with the device.

$\Longrightarrow$ Do not wear clothing with metal parts.

$\Longrightarrow$ Do not wear jewellery.

$\Longrightarrow$ Do not wear glasses with a metal frame.

Protective clothing

If a possible danger to your eyes is present, wear protective goggles, especially in the following cases:

- when knocking in or knocking out pins and similar parts with a hammer
- when using spring hooks
- when loosening or inserting springs, snap rings and gripping rings
- when soldering
- when using solvents, cleaning agents or other chemicals

Protective equipment

WARNING!

Risk of injury in case of missing or faulty protective equipment.

⟹   After performing maintenance work, attach all safety equipment (covers, safety precautions, ground cables etc.).

⟹   Replace faulty parts and those which have become unusable.

General safety instructions

The label printer is designed for power supply systems from 230 V AC. Connect the label printer only to electrical outlets with a ground contact.

Couple the label printer to devices using extra low voltage only.

Before making or undoing connections, switch off all devices involved (computer, printer, accessories etc.).

Operate the label printer in a dry environment only and do not get it wet (sprayed water, mist etc.).

Maintenance and servicing work can only be carried out by trained personnel.

Operating personnel must be trained by the operator on the basis of the operating manual.

If the label printer is operated with the cover open, ensure that clothing, hair, jewellery and similar personal items do not contact the exposed rotating parts.

The print unit and parts of it (e.g. printhead) can get hot during printing. Do not touch the printhead during operation. Cool down the print unit before changing material, removal or adjustment.

Never use highly inflammable consumables.

Carry out only the actions described in these operating instructions. Any work beyond this may only be performed by the manufacturer or upon agreement with the manufacturer.

Unauthorized interference with electronic modules or their software can cause malfunctions.

Other unauthorized work or modifications to the direct print module can endanger operational safety.

Always have service work done in a qualified workshop, where the personnel have the technical knowledge and tools required to do the necessary work.

There are warning stickers on the direct print modules that draw your attention to dangers. Therefore the warning stickers are not to be removed as then you and others cannot be aware of dangers and may be injured.

DANGER!

Danger to life and limb from power supply!

⟹   Do not open the casing.

2.2   Safety Handling when Working with Electricity

Qualifications of personnel

⇒ The following work may only be performed by instructed and trained electricians:

- work on the electrical assemblies
- work on the device while it is open and connected to the power supply.

General precautions to be heeded when beginning maintenance

⇒ Locate the emergency-stop or power switch so that it can be actuated in case of an emergency.

⇒ Unplug the device from the electrical outlet before performing the following work:

- removing or installing power supply units
- working in the immediate vicinity of exposed power supply parts
- mechanical inspection of power supply parts
- modifying the device circuits.

⇒ Ensure that the device is de-energized.

⇒ Check the workplace for possible sources of danger, e.g. moist floors, defective extension cables, faulty protective conduction connections.

Additional precautions to be heeded for devices with exposed energized parts

⇒ Give another person the task of remaining near the workplace. This person must be familiar with the location and operation of the emergency-stop and power switches and switch off the power if danger arises.

⇒ Use only one hand while working on electrical circuits when a device is switched on. Hold the other hand behind your back or put it in your jacket pocket.
This prevents the electricity from flowing through your body.

Tools

⇒ Do not use worn or damaged tools.

⇒ Use only tools and testing equipment that is suitable for the respective task.

What to do in case an accident occurs

⇒ Proceed in a very cautions and calm manner.

⇒ Avoid endangering yourself.

⇒ Switch the power off.

⇒ Request medical help (emergency physician).

⇒ Call for first aid if necessary.

3   Cleaning

DANGER!

Risk of death by electric shock!

$\Longrightarrow$ Before opening the housing cover, disconnect the label printer from the mains supply and wait for a moment until the power supply unit has discharged.

Cleaning plan

Cleaning task	Frequency
General cleaning (see section 3.1, page 11).	As necessary.
Clean the transfer ribbon drawing roller (see section 3.2, page 12).	Each time the transfer ribbon is changed or when the printout is adversely affected.
Clean the print roller (see section 3.3, page 12).	Each time the label roll is changed or when the printout and label transport are adversely affected.
Clean the printhead (see section 3.4, page 13).	**Direct thermal printing:** Each time the label roll is changed. **Thermal transfer printing:** Each time the transfer ribbon is changed or when the printout is adversely affected.
Clean the label photocell (see section 3.5, page 14).	When replacing the label roll.

WARNING!

Risk of fire by easily inflammable label soluble!

$\Longrightarrow$ When using label soluble, dust must be completely removed from the label printer and cleaned.

3.1   General Cleaning

CAUTION!

Abrasive cleaning agents can damage the label printer!

$\Longrightarrow$ Do not use abrasives or solvents to clean the outer surface of the label printer.

$\Longrightarrow$ Remove dust and paper fuzz in the printing area with a soft brush or vacuum cleaner.

$\Longrightarrow$ Clean the outer surfaces with an all-purpose cleaner.

3.2   Transfer Ribbon Drawing Roller

A soiled drawing roller can lead to reduced print quality and can affect transport of material.

1. Open the printer cover.

2. Remove the transfer ribbon from the label printer.

3. Remove deposits with the roller cleaner and a soft cloth.

4. If the roller appears damaged, replace it.

3.3   Print Roller

A soiled print roller can lead to reduced print quality and can affect transport of material.

> **CAUTION!**
>
> Print roller can be damaged!
>
> $\implies$ Do not use sharp or hard objects to clean the print roller.

Figure 1

1. Open the printer cover.

2. Turn the red lever (B) counter clockwise to lift up the printhead (A).

3. Remove labels and transfer ribbon from the label printer.

4. Remove deposits with the roller cleaner and a soft cloth.

5. Turn the roller (C) manually step by step to clean the complete roller (only possible when printer is switched off, as otherwise the step motor is full of power and the roller is kept in its position).

3.4   Printhead

Printing can cause accumulation of dirt at printhead e.g. by colour particles of transfer ribbon, and therefore it is necessary to clean the printhead in regular periods depending on operating hours, environmental effects such as dust etc.

!   **CAUTION!**

Printhead can be damaged!

$\Rightarrow$ Do not use the sharp or hard objects to clean the printhead.

$\Rightarrow$ Do not touch the protective glass layer of the printhead.
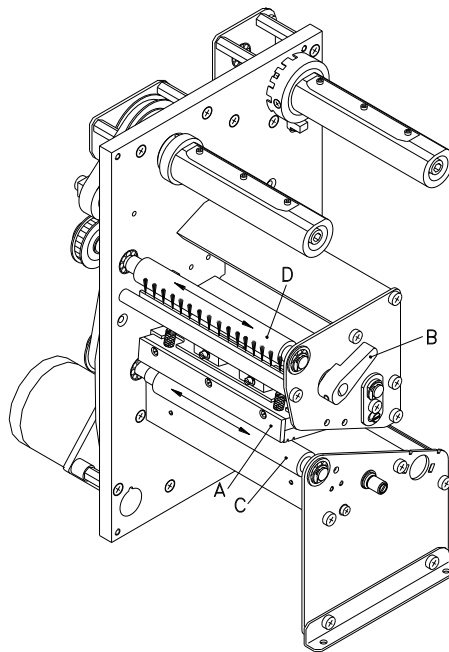

Figure 2

1.   Open the printer cover.
2.   Turn the red lever (B, in Figure 1) counter clockwise to lift up the printhead.
3.   Remove labels and transfer ribbon from the label printer.
4.   Clean the printhead surface with a special cleaning pen or a cotton swab dipped in pure alcohol.
5.   Before using the label printer, let the printhead dry for about two to three minutes.

3.5 Label Photocell

CAUTION!

Label photocell can be damaged!

$\Rightarrow$ Do not use sharp or hard objects or solvents to clean the label photocell.

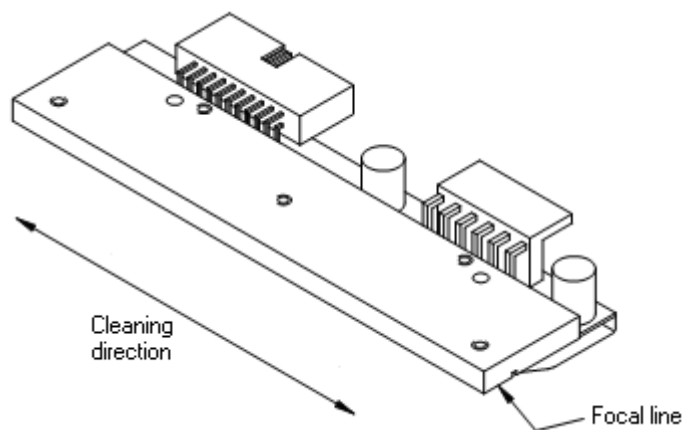The label photocell can be soiled with paper dust. This may affect the label scanning.
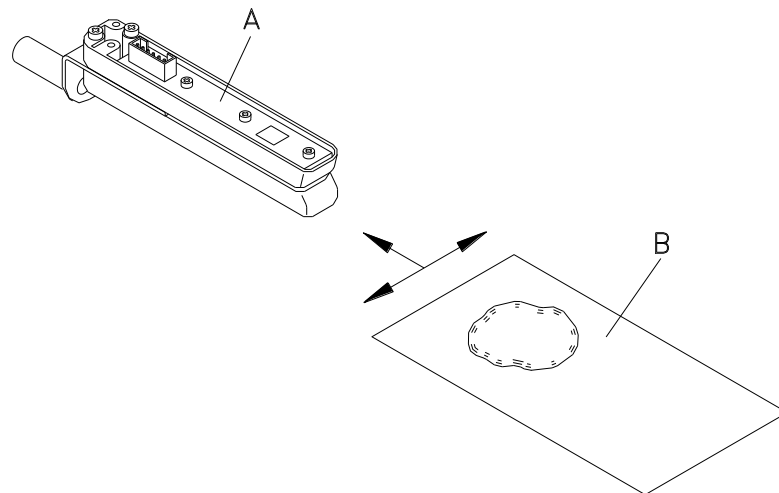
Figure 3

1. Open the printer cover.

2. Turn the red lever (B, in Figure 1) counter clockwise to lift up the printhead.

3. Remove labels and transfer ribbon from the label printer.

4. Blow out the photocell (A) with pressure gas spray.
   Observe strictly the instructions on the spray can!

5. Clean the label photocell (A) additionally with a cleaning card (B) before soaked in pure alcohol. Move the cleaning card from one side to the other (see illustration).

6. Reload labels and transfer ribbon.

4   Replacing Components

DANGER!

Risk of death via electric shock!

$\Longrightarrow$ Before opening the housing cover, disconnect the label printer from the mains supply and wait for a moment until the power supply unit has discharged.

4.1   Tool List

Some service work requires the following tools:

- Philips-head screwdriver, size 2
- Screwdriver, size 5
- Allen wrench 1,5 mm / 2 mm / 2,5 mm
- Hexagonal wrench 3 mm
- Spring scale 50 N

4.2   Primary Fuse
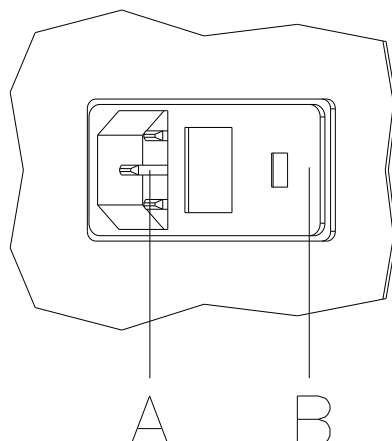
Figure 4

Remove the primary fuse

1.   Unplug the power plug from the filter block (A).

2.   Open the cover (B).
     Lever it off laterally with a screwdriver.

3.   Pull the fuse carrier (red) behind the cover outwards.

4.   Remove the micro fuse 2AT.

Install the primary fuse

1.   Insert the micro fuse 2AT into the fuse carrier (red).

2.   Plug the fuse carrier into the line filter block (A).

3.   Close the cover (B).

4.   Connect the power cable.

4.3   Secondary Fuse
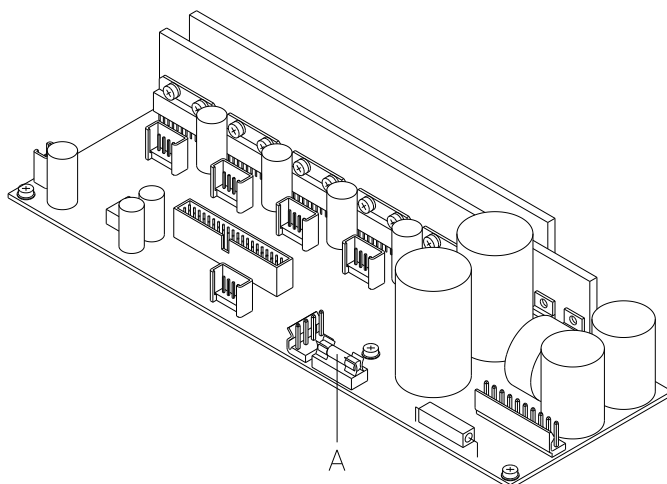
1.   Remove the left printer cover.
     Loosen two screws at the lower left printer edge and three screws at the chassis upper edge.

2.   Remove the protective conductor at the inside of printer cover.

3.   Replace the secondary fuse (A) on the power supply.

4.   Mount again the printer cover.

Figure 5

4.4 Printhead (General)
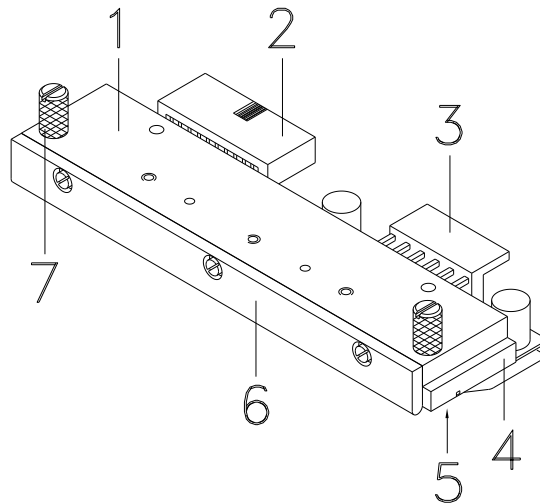
Figure 6

1   Head plate
2   Plug connection signal
3   Plug connection voltage
4   Printhead
5   Focal line
6   Guiding
7   Knurled screw

> **! CAUTION!**
>
> The printhead can be damaged by static electricity discharges and impacts!
>
> ⟹   Set up the printer on a grounded, conductive surface.
>
> ⟹   Ground your body, e.g. by wearing a grounded wristband.
>
> ⟹   Do not touch the contacts on the plug connections (2, 3).
>
> ⟹   Do not touch the printing line (5) with hard objects or your hands.

4.5   Flat Type Printhead

Figure 7

Remove the printhead

1. Remove labels and transfer ribbon from the label printer.

2. When the printhead is closed, loosen the knurled screws (H).

3. Turn the red lever (F) counter clockwise to lift up the printhead.

4. If the printhead (G) is not disengaged on the pressure roller, continue loosen the knurled screws (H).

5. Remove the printhead carefully to the front until you can reach the plug connections.

6. Remove the plug connections and then remove the printhead (G).

Install the printhead

1. Attach the plug connections.

2. Position the printhead in the printhead mounting bracket in such a way that the pins are secured in the corresponding holes in the head plate.

3. Lightly keep the printhead mounting bracket on the print roller with one finger and check for correct positioning of the printhead.

4. Screw in the screw (H) and tighten it.

5. Reload the labels and transfer ribbon.

6. Check the resistance value on the type plate of printhead and if necessary change the value in the service functions/heater resistance.

4.6   Corner Type Printhead

Figure 8

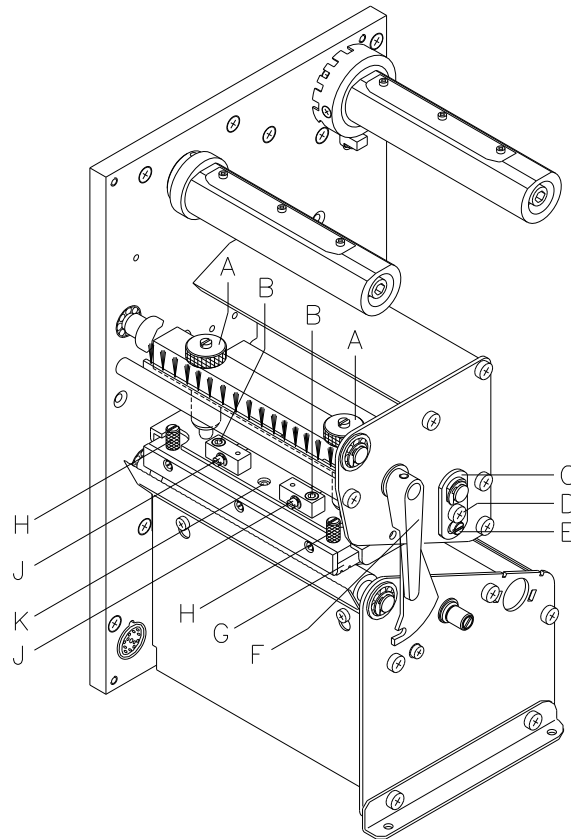**Remove the printhead**

1. Remove labels and transfer ribbon from the label printer.

2. When the printhead is closed, loosen the knurled screws (J).

3. Turn the red lever (F) counter clockwise to lift up the printhead.

4. If the printhead (G) is not disengaged on the pressure roller, continue loosen the knurled screws (J).

5. Remove the printhead carefully to the front until you can reach the plug connections.

6. Remove the plug connections and then remove the printhead (G).

Install the printhead

1. Attach the plug connections.

2. Position the printhead in the printhead mounting bracket in such a way that the pins are secured in the corresponding holes in the head plate.

3. Lightly keep the printhead mounting bracket on the print roller with one finger and check for correct positioning of the printhead.

4. Screw in the screw (J) and tighten it.

5. Reload the labels and transfer ribbon.

6. Check the resistance value on the type plate of printhead and if necessary change the value in the service functions/heater resistance.

4.7   Print Roller

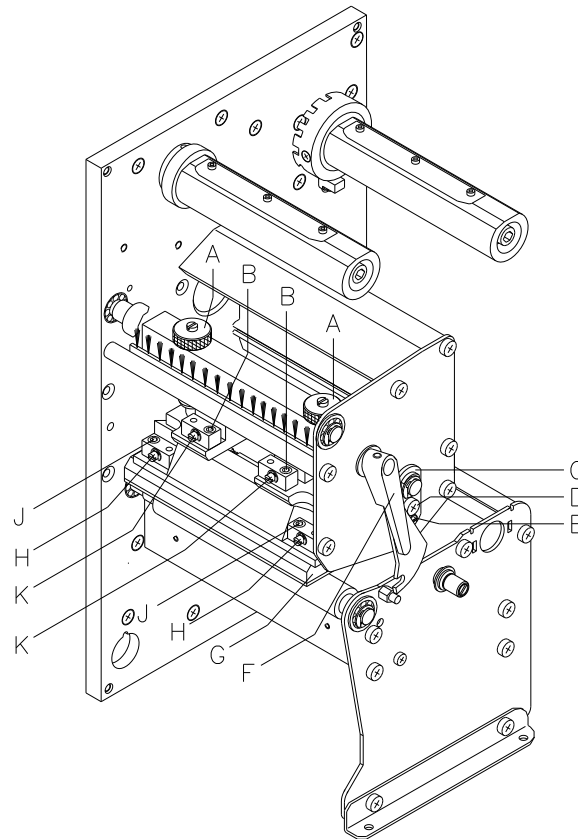
Figure 9

Remove the print roller

1. Remove the left printer cover.
    Loosen three screws at the lower left printer edge and three screws at the chassis upper edge.

2. Remove the protective conductor at the inside of the printer cover.

3. Loosen the screws (A) and remove the tear off edge (if mounted) before the pressure roller.

4. Turn the red lever (E) clockwise to lift up the printhead.

5. Loosen the pins (F) from the belt pulley (G) on the print roller (D).

6. Remove the protective disc (C) and the ball bearing (B).

7. Pull the print roller (D) through the drillings outwards.

8. Hold the belt pulley (G).

Install the print roller

1. Insert the new print roller (D) through the drillings and the belt pulley (G).

2. Mount the protective disc (C) and the ball bearing (B).

3. When reassembling the belt pulley (G), a pin must meet the milled surface of the roller axe.

4. Tighten the pins (F) strongly.
    The roller has to be installed precisely.

5. Connect the protective conductor to the inside of cover.

6. Mount again the printer cover.

4.8   Label Photocell

NOTICE!

Soiling of the label photocell can also cause malfunctions. Before replacing the label photocell, check whether it is soiled and clean it if necessary (see chapter 3.5, page 14).
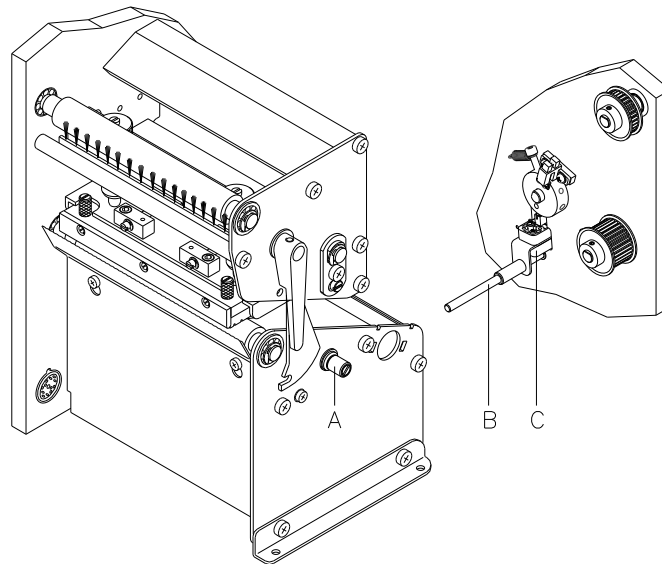
Figure 10

Remove the label photocell

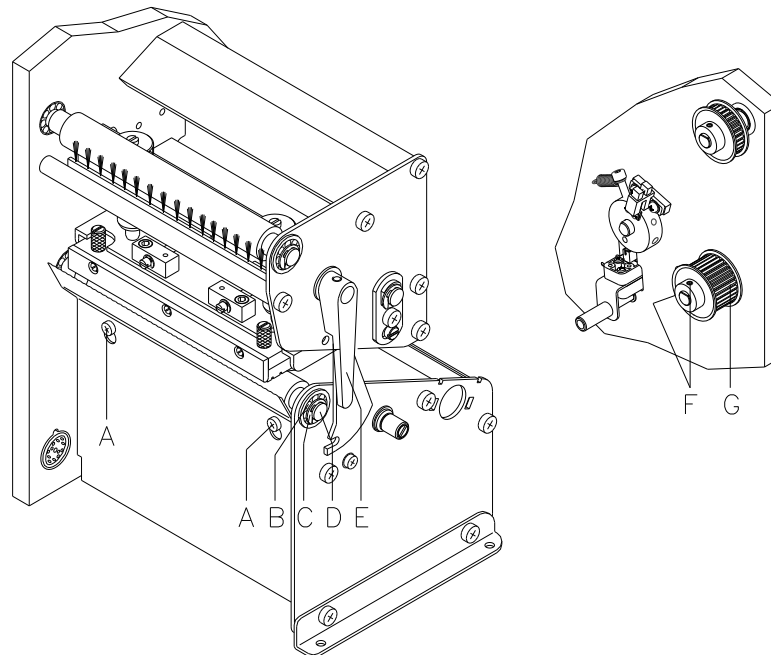1. Remove media from the printer.

2. Remove the left printer cover.
    Loosen three screws at the lower left printer edge and three screws at the chassis upper edge.

3. Remove the protective conductor at the inside of printer cover.

4. Turn the knurled knob (A) counter clockwise, until the photocell (C) can be removed from the adjusting axis (B).

5. Unplug the cable from the plug on the rear end of the label photocell (C).

Install the label photocell

6. Connect the cable to the label photocell (C).

7. Place the photocell (C) on the adjusting axis (B) and turn the knurled knob (A) in clockwise direction until the photocell arrives at the desired position.

8. Connect the protective conductor to the inside of printer cover.

9. Install the left printer cover.

10. Adjust the label photocell.

NOTICE!

When reinstalling the photocell take care that the photocell runs centrically in the plate aperture. One-sided tilting can entail a worse signal level or label accumulation.

4.9 CPU PCB
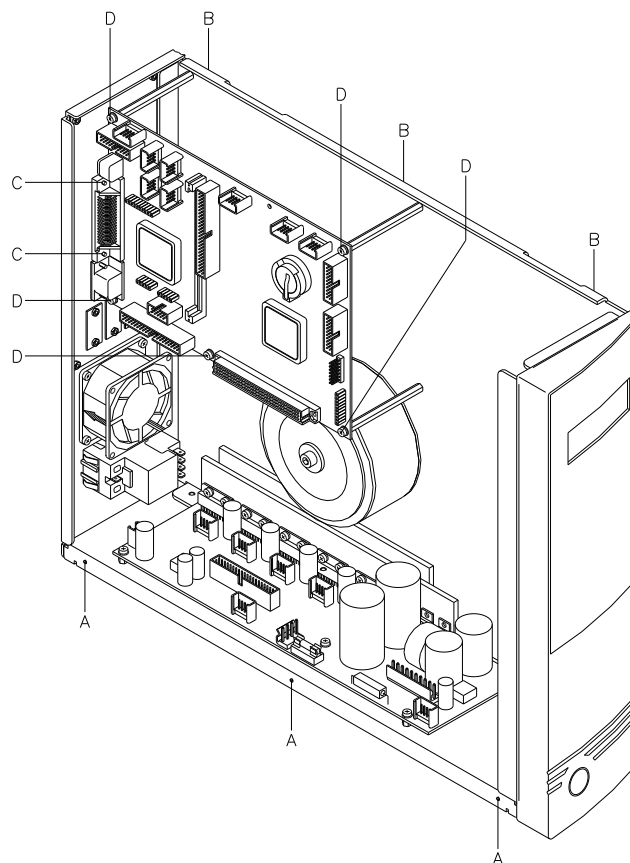
Figure 11

Remove the CPU PCB

1. If possible, save the printer configuration to a memory card.

2. Unplug the printer from the electrical outlet.

3. Detach all interface cables from the back of the printer.

4. Remove the left printer cover.
    Loosen three screws (A) at the lower left printer edge and three screws (B) at the chassis upper edge.

5. Remove the protective conductor at the inside of the printer cover.

6. Unplug all side plug connections from the CPU PCB.

7. Remove the two fixing bolts (B) from the Centronics interface.

8. Remove the five fixing screws (D) from the CPU PCB.

9. Carefully remove the CPU PCB.

**Install the
CPU PCB**

1. Place the CPU PCB into the printer.

2. Secure the PCB with the five fixing screws (D, Figure 11).

3. Fasten the two fixing screws (C, Figure 11) of the Centronics interface.

4. Insert all plug connections on the PCB.

5. Connect the protective conductor to the inside of printer cover.

6. Install again the left printer cover with the screws (A + B, Figure 11).

7. Restore all interface connections on the back of the printer.

8. Connect the power cable at the rear of the printer.

9. Update the firmware if necessary.

10. Adjust the label photocell.

11. Load the printer configuration from the memory card if possible. Otherwise, set the printer configuration via the operating panel.
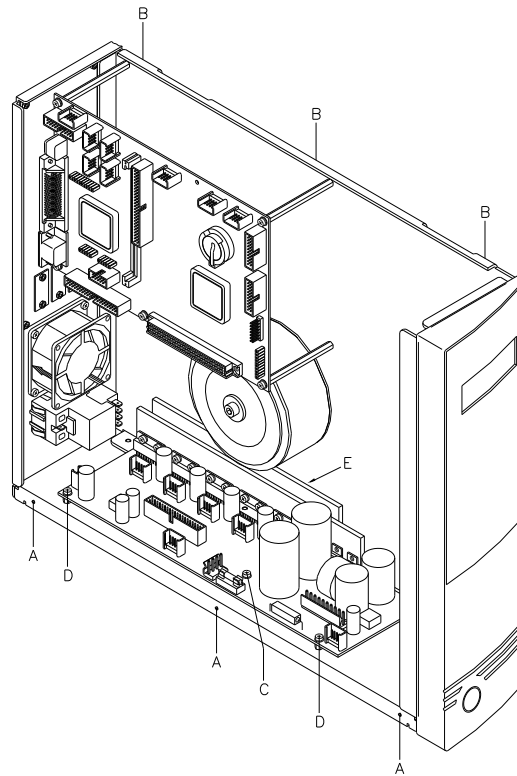
4.10 Power Supply

Figure 12

Remove the power supply

1. Unplug the printer from the electrical outlet.

2. Remove left printer cover.
    Loosen three screws (A) at the lower left printer edge and three screws (B) at the chassis upper edge.

3. Remove the protective conductor at the inside of the printer cover.

4. Unplug all cable connections from the power supply (F).

5. Remove the screw (C) at the rectifier.

6. Remove the fixing screws (D).

7. Remove the three countersink screws (E) at the print mechanics side.

8. Remove the power supply unit.

Install the power supply

1. Insert the new power supply. Take care that no cables are clamped below the heat sink.

2. Screw again the three countersink screws (E).

3. Insert again the fixing screws (D).

4. Mount the screw (C) at the rectifier.

5. Connect all cable connections at the power supply

6. Connect the protective conductor to the inside of printer cover.

7. Install again the left printer cover with screws (A + B).

8. Connect power cable at the printer rear.

4.11 Printhead FPGA

1. Remove the defective FPGA (B) from the PLCC support base with a suitable displacement pincer.

2. Pay attention to polarity and press the new FPGA into the support base.

4.12 I/O FPGA

1. Separate the I/O plate (if available) from the CPU.
    The I/O FPGA is now visible.

2. Remove the defective FPGA (A) from the PLCC support base with a suitable displacement pincer.

3. Pay attention to polarity and press the new FPGA into the support base.

4.13 Battery

DANGER!

Danger of explosion due to improper replacement of the battery!

⟹   Use non-conductive tools.
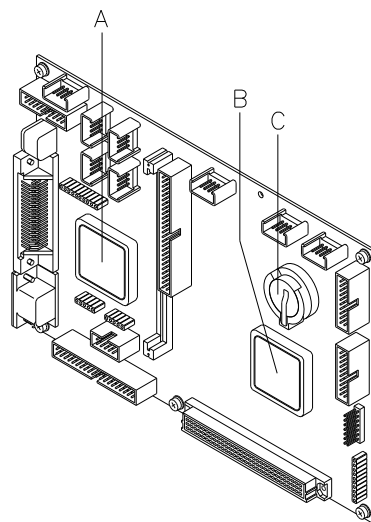
⟹   Pay attention to polarity.

Figure 13

1. Lift up the fixing bracket by means of a non-metallic device (e.g. plastic ruler).

2. Remove the battery (C).

3. Insert a new battery (CR 2032) into the support and pay attention to the position of polarity.

5   Adjustments, Settings and Alignments

DANGER!

Risk of death via electric shock!

$\Longrightarrow$ Before opening the housing cover, disconnect the label printer from the mains supply and wait for a moment until the power supply unit has discharged.

5.1   Print Mechanism

Major adjustment of the printing mechanism beyond format-based settings is only required if the printhead assembly has been removed or parts in this area have been replaced. Excluded from this is the replacement of the printhead, after which readjustment is generally not required.

The following print quality imperfections may indicate maladjustment of the printing mechanism:

- Print image too light
- Print image is spotty
- Print image lighter on one side
- Horizontal lines not parallel to the horizontal label edges
- Clear lateral drift of the transfer ribbon

NOTICE!

Print image errors can also arise from wrinkling of the transfer ribbon. This is why the transfer ribbon feed path and the head locking system should be checked before making adjustments to the printing mechanism (see *'operating manual'*).

Adjustment of the printing mechanism encompasses the following procedures in the order specified:

1. Adjust the position of printhead (see chapter 5.2, page 28).
2. Adjust the ribbon feed path (see chapter 5.4, page 32).
3. Adjust the ribbon rewinder/unwinder (see chapter 5.5, page 33).
4. Adjust the printhead photocell (see chapter 5.6, page 34).

5.2   Flat Type Printhead Position

Complete the following printhead settings to achieve the best possible print image:

$\Rightarrow$ Align the heating line with the highest point of the print roller. Density of the print image is the greatest at this point.

$\Rightarrow$ Set the parallelism of horizontal lines with the edge of the label.

> **! CAUTION!**
>
> The printhead assembly can be damaged.
>
> Attempting to adjust the printhead when the fixing screw (E) is tight can lead to defects at the printhead assembly.
>
> $\Rightarrow$ Always loosen the fixing screw (E) before adjusting the printhead.

> **i NOTICE!**
>
> Open and close the printhead locking device after each step of the adjustment.

Parallelism

An important characteristic for a high quality print is the parallelism of the focal line of the thermal printhead to the pressure roll. Because of the fact that the position of focal line of the printhead depends on fluctuations caused by production, it is necessary to adjust the parallelism.
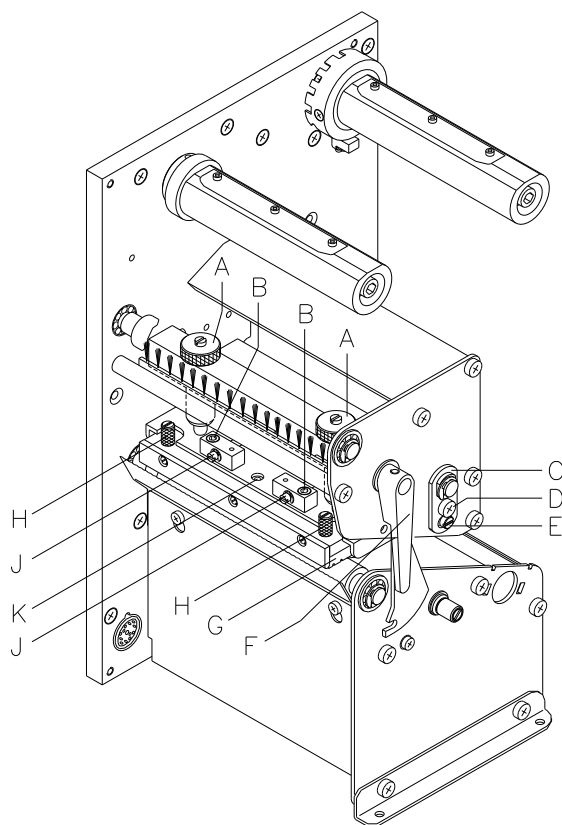
1. Loosen the screws (B) with a hexagon key about one quarter turn.
2. Adjust the parallelism with the adjusting screws (J).
   Clockwise = printhead moves backwards
   Counter clockwise = printhead moves forwards
3. Adjust the parallelism as long as the printing result comes up to your full expectation.
4. Fasten again the screws (B).
5. Start a print order with approx. 10 labels and control the correct passage of transfer ribbon.

Figure 14

**Pressure balance
right/left**

After adjusting parallelism and no even strong pressure exists over the complete print width, by means of a plate (C, Figure 14) you can set the balance as follows:

1. Loosen the screw (D, Figure 14) about one quarter turn.
2. Turn the eccentric bolt (E, Figure 14) to adjust the pressure balance.
   Adjust the balance as long as the printing result comes up to your full expectation.
3. Fasten again the screw (D, Figure 14).
4. Start a print order with approx. 10 labels and control the correct passage of transfer ribbon

Pressure

Increasing the head contact pressure leads to an improvement of the print image density on the corresponding side and to a shifting of the ribbon feed path in the corresponding direction.

> **! CAUTION!**
>
> Damage of printhead by unequal use!
>
> $\Longrightarrow$ Only change the factory settings in exceptional cases.

The selection of the smallest value can optimise the life cycle of printhead.

1. Turn the pressure screws (A, Figure 14) to change the pressure of printhead.
2. Turning the pressure screws (A, Figure 14) as far as they will go in clockwise direction results in a pressure increase of 10N in contrast to the factory setting.
3. Turning the pressure screws (A, Figure 14) exactly one rotation from the right stop position counter clockwise results in the factory settings.

> **i NOTICE!**
>
> It is importantly that the knurled button which is coated with protective lacquer is not removed from the pressure screw as otherwise the above mentioned settings are faulty.

5.3   Corner Type Printhead Position

Complete the following printhead settings to achieve the best possible print image:

⟹   Align the heating line with the highest point of the print roller. Density of the print image is the greatest at this point.

⟹   Set the parallelism of horizontal lines with the edge of the label.

> **CAUTION!**
>
> The printhead assembly can be damaged.
>
> Attempting to adjust the printhead when the fixing screw (B + J) is tight can lead to defects at the printhead assembly.
>
> ⟹   Always loosen the fixing screw (B + J) before adjusting the printhead.

> **NOTICE!**
>
> Open and close the printhead locking device after each step of the adjustment.

Parallelism

An important characteristic for a high quality print is the parallelism of the focal line of the thermal printhead to the pressure roll. Because of the fact that the position of focal line of the printhead depends on fluctuations caused by production, it is necessary to adjust the parallelism.
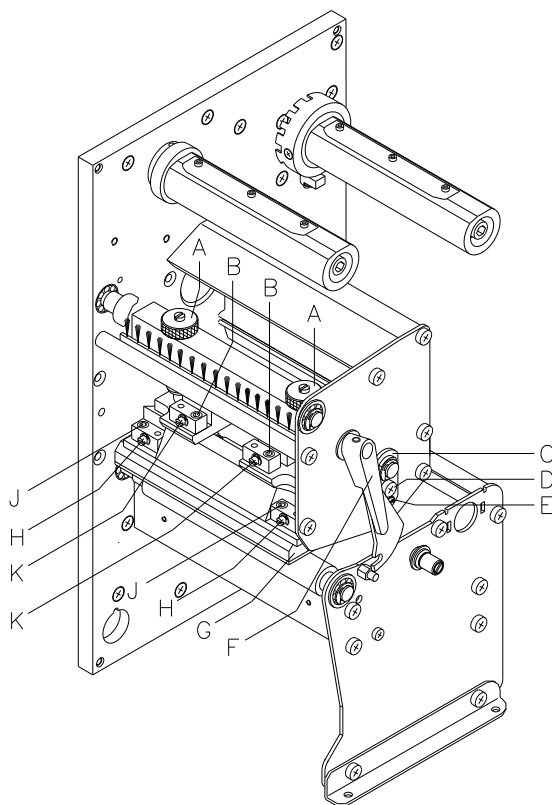
The form of the Corner Type printhead needs the setting of parallelism in direction of the adjusting angle and in horizontal position. It needs a little bit of experience to know in which direction you have to adjust the printhead to receive a high quality printing.

1.   Loosen the screws (J or B) with a hexagon key about one quarter turn.

2.   Adjust the parallelism with the adjusting screws (H or K).
     Clockwise = printhead moves backwards

3.   Counter clockwise = printhead moves forwards

4.   Adjust the parallelism as long as the printing result comes up to your full expectation.

5.   Fasten again the screws (J or B).

6.   Start a print order with approx. 10 labels and control the correct passage of transfer ribbon.

Figure 15

Pressure balance right/left

After adjusting parallelism and no even strong pressure exists over the complete print width, by means of a plate (C, Figure 15) you can set the balance as follows:

1. Loosen screw (D, Figure 15) about one quarter turn.

2. Turn the eccentric bolt (E, Figure 8) to adjust the pressure balance.
   Adjust the balance as long as the printing result comes up to your full expectation.

3. Fasten again the screw (D, Figure 15).

4. Start a print order with approx. 10 labels and control the correct passage of transfer ribbon.

Pressure

Increasing the head contact pressure leads to an improvement of the print image density on the corresponding side and to a shifting of the ribbon feed path in the corresponding direction.

> **! CAUTION!**
>
> Damage of printhead by unequal use!
>
> $\Longrightarrow$ Only change the factory settings in exceptional cases.

The selection of the smallest value can optimise the life cycle of printhead.

1. Turn the pressure screws (A, Figure 15) to change the pressure of printhead.

2. Turning the pressure screws (A, Figure 15) as far as they will go in clockwise direction results in a pressure increase of 10N in contrast to the factory setting.

3. Turning the pressure screws (A, Figure 15) exactly one rotation from the right stop position counter clockwise results in the factory settings.

> **i NOTICE!**
>
> It is important that the knurled button which is coated with protective lacquer is not removed from the pressure screw as otherwise the above mentioned settings are faulty.

5.4   Transfer Ribbon Feed Path

Adjust the transfer ribbon feed path by changing the head contact pressure. Increasing the head contact pressure with the screws (A) shifts the ribbon feed path in the corresponding direction. Possibly arising formation of wrinkles can be eliminated by bowing the printhead.

! CAUTION!

The printhead assembly can be damaged when bowing the printhead.

Turning the adjustment screw (K) too hard can cause damage to the printhead assembly.

⟹   As soon as a clear resistance is perceived when turning the adjustment screw (K), only continue turning the screw in very small increments, but no more than one eighth of a turn.

⟹   Only turn the adjustment screw (K) as far as is absolutely necessary.
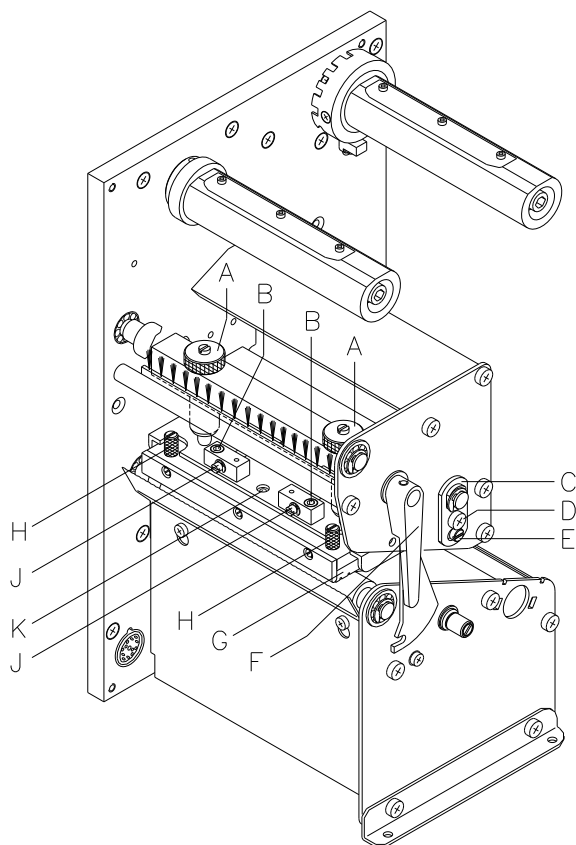
1.   Check the transfer ribbon feed path. The wound up ribbon should be the same distance from the disk of the winder as the supply roller is from the disk of the rewinder.

2.   If the ribbon runs inward or outward, turn the corresponding screw (J) after losing the screw (B) clockwise in small increments.

3.   Wait until the ribbon feed path has stabilized after each step of the adjustment.

4.   Check the ribbon feed path for wrinkles.

5.   If the wrinkles cannot be remedied (e.g. wrinkles in the centre), turn the adjustment screw (K) clockwise with extreme care (see warnings) using a hexagonal wrench (2 mm) and observe the ribbon feed path. When the adjustment screw (K) is tightened, the printhead is bent downward slightly in the centre. A slight lightening at the edge areas of the print image could occur here.

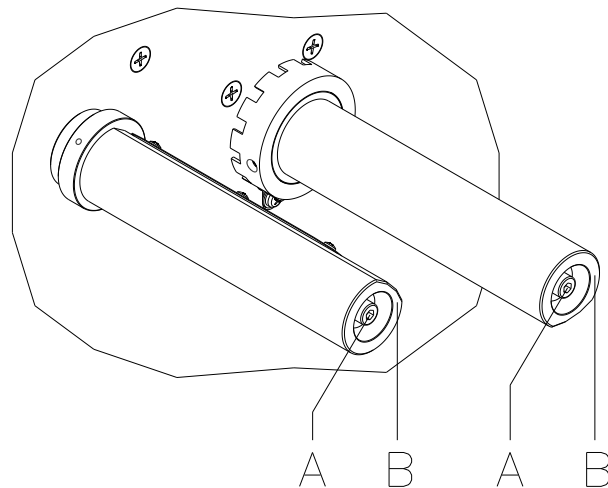Figure 16

5.5 Ribbon Rewinder/Unwinder

Figure 17

Due to the many different transfer ribbon variants regarding roller width, length and qualities it is necessary to provide the possibility to set transfer ribbon tension.

The transfer ribbon tension is to set in such way that no wrinkles in the ribbon appear but it is transported in the same way as the labels.

When using a too high ribbon tension this results usually in an excellent run of the transfer ribbon but this could lead to streaks onto the label or to a rip of ribbon particularly with narrow roles.

Ex factory the role tension is set to a transfer ribbon 110 mm width and standard quality. As approximate values for the factory setting the following can be accepted:

Transfer ribbon unwinder:
Distance of the screw head (A) to the roller face (B) = 2 mm

Transfer ribbon rewinder:
Distance of the screw head (A) to the roller face (B) = 4 mm

Tighten the hex. head screw (A) = Increasing the transfer ribbon tension

Loosen the hex. head screw (A) = Reducing the transfer ribbon tension

5.6   Head Photocell

The head photocell prevents printing from occurring when the printhead is open.
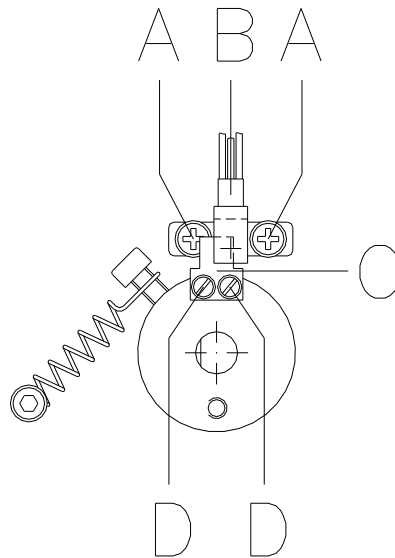

Figure 18

1.   Unplug the printer from the electrical outlet.

2.   Remove the left printer cover.
     Loosen three screws at the lower left printer edge and three screws at the chassis upper edge.

3.   Lock the printhead.

4.   Slightly loosen the fixing screws (A) of the photocell (B).

5.   Shift the photocell (B) in the elongated hole sideways in such way that the plate (C) extends slightly into the centre of photocell (into the fork).

6.   Tighten again the screws (A).

7.   If this measure should not be sufficient, the plate (C) can be also shifted by loosening the screws (D).

8.   Install again the left printer cover.

9.   Control the function of head photocell.
     Access the service functions and enter the photocell parameters so control the level value of 'H'.
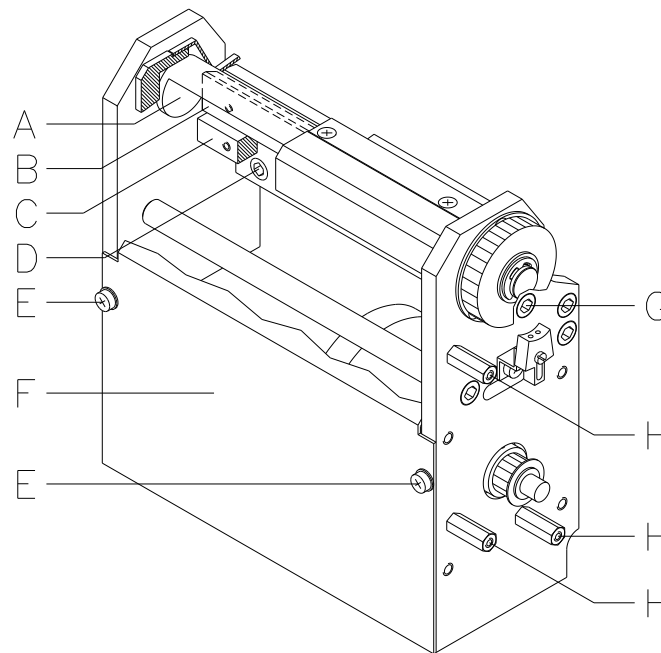
5.7 Cutter Ledge

Figure 19

> **! CAUTION!**
>
> Risk of injury, particularly during maintenance, the cutter blades are sharp!
>
> ⟹ Switch off the printer the before attaching the cutter!
>
> ⟹ The cutter may only be used when it is mounted on the printer!
>
> ⟹ Do not try to cut any materials which exceed the maximum width or thickness specifications.
>
> ⟹ Do NOT touch the area of the moving blades!

1. Loosen the screws (E) and remove the front plate (F) of the cutter unit.

2. Loosen the hex socket head screws (D) and remove the cutter unit.

3. Place the cutter unit in front of the printer and make sure that the connecting cable has to be connected.

4. Insert the power plug and switch on the printer.

5. Insert paper or labels from behind through the inserting angle of cutter unit between the cutter shaft (A) and cutter ledge (B).

6. Start a single cut.
   In the main menu of printer or if a print order has been stopped, press the key ▶ to start a single cut.

If the cut is incorrect, the pressure between the cutter shaft (A) and cutter ledge (B) is to be increased as described below:

1. Remove the right side cover of the cutter unit.
    Remove three screws of the hexagon head bolts (H).

2. Loosen three screws (G) of the spacer pillar.

3. Turn the spacer pillar (C) slightly downwards with a flat spanner (size 8).

4. Tighten again two screws (G).

5. Start a single cut.
    In the main menu of printer of if a print order has been stopped, press key ▶ to start a single cut.

In case the quality of the cut is not sufficient then repeat the above mentioned steps.

If the pressure is too strong this could result in an increased ware. Therefore select the pressure only as high as it is necessary for the used material.

Switch off the printer and mount again the cutter unit in reverse order.

5.8   Angle of Aperture (Cutter Unit)

!   **CAUTION!**

Risk of injury, particularly during maintenance, the cutter
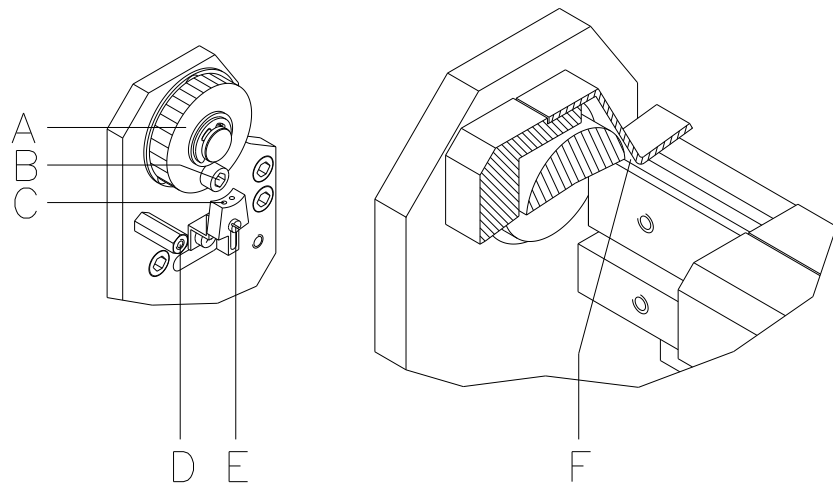blades are sharp!

Figure 20

If the labels show dog-ears after the cutting procedure or if a paper
jam occurred then the angle of aperture (F) is to be increased.

1. Remove three countersink screws (D).

2. Remove the right cover of cutter unit.
    The reflexion photocell (C) scans the screw head (B) onto the belt
    drive (A).

3. If the angle of aperture is too small, the photocell has to be turned
    slightly in clockwise direction.
    Loosen the screw (E). Keep the distance of 5 mm between
    photocell and screw head.

4. Place the cover onto the spacer pillar in order that the reflexion
    photocell is not exposed to extraneous light.

5. Start a number of test cuts.
    Verify if the cutter unit effects the cuttings over the complete
    passage width.

6. If an uncut margin remains at the right side then the angle of
    aperture is too big.
    In this case turn back slightly the photocell.

7. Mount again the cover.

5.9   Pressure Curve (Ribbon Save)

If the ribbon save function is activated and the printhead is not enough lifted up from the label material, then the pressure curve is to be adjusted anew. The pressure curve is onto the shaft of the ribbon save motor (A).
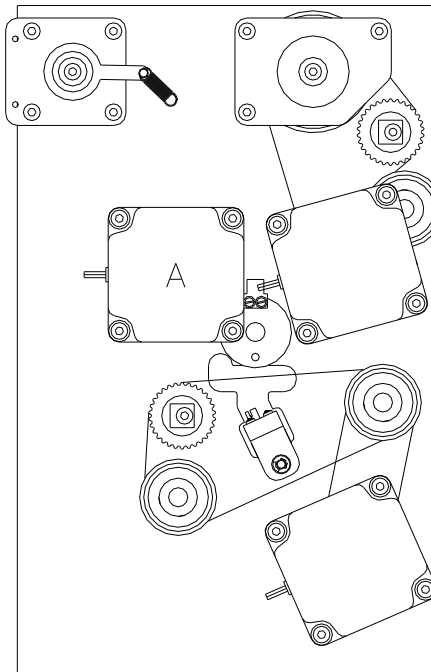

Figure 21

1. Remove the left printer cover.
    Loosen 3 screws at the lower left printer edge and three screws at the chassis upper edge.

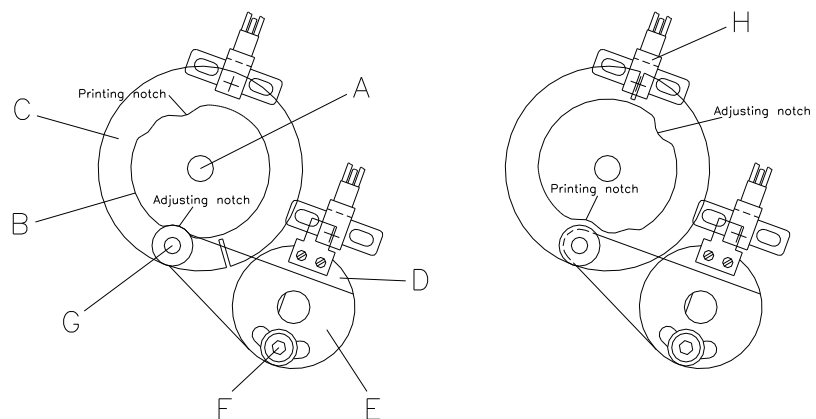2. Remove the protective conductor at the inside of the printer cover.

Figure 22

The sketch (see Figure 22) shows from behind the shaft of ribbon save motor (A) with the pressure curve (B) and disc (C). The bearing ring (D) with the attached sole plate (E) is underneath.

3. Make sure that the printhead is closed.

4. Loosen the hex socket head screw (F) about 1 turn until the sole plate (E) with the attached ball bearing is freely mobile.

5. Turn by hand the motor shaft with pressure curve and disk in the adjusting position (see Figure 22).

6. Press the sole plate (E) with the ball bearing (G) in the adjusting notch of the pressure curve. Take care of not to have too much play. Fasten the hex socket head screw (F).

7. Lift up the printhead.

8. Turn by hand the motor shaft with pressure curve and disc into the adjusting position (see Figure 22).

9. Move down the printhead.

10. Turn by hand the motor shaft with pressure curve and disk from the lift to the right until a slight resistance can be noticed. If the slot in the disk can be moved slightly to the right and to the left out of the photocell (H), then the pressure curve is adjusted correctly.

11. If the gap should not be in the range of the photocell, the following causes are possible:

    •   The wrong notch on the pressure curve was used for the adjustment.

    •   The pressure curve is twisted to the disc on the motor shaft. The slot of disc has to be placed exactly face to face with the printer position notch!

12. Connect the protective conductor to the inside of printer cover.

13. Move the printer cover onto the chassis.

14. Switch on the printer.

15. Press the keys ▲ and ▼ to move the printhead down and up. If very thick label material is used it could occur that the printhead is not enough lifted up. In order to position the printhead correctly, repeat the adjusting steps again. However, keep the material during the adjustment between the printhead and the roller.

16. Install again the printer cover.
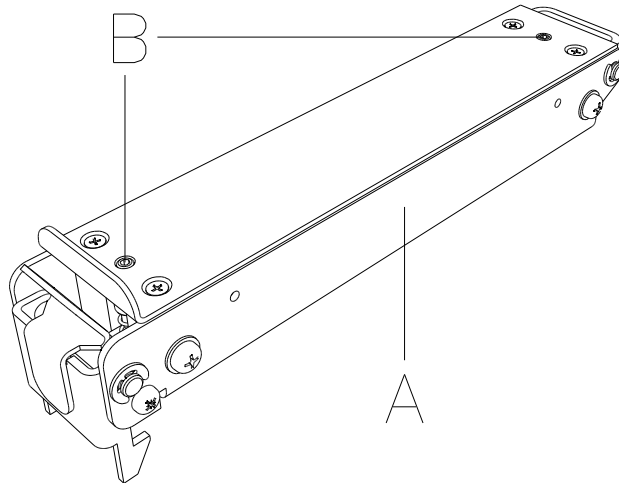
5.10 Supporting Bar (Ribbon Save)

Figure 23

If the transfer ribbon save function is active and a paper jam occurs or if the print position onto the label is incorrect, this could be traced back to an inadequate adjustment of the supporting bar (A).

The supporting bar (A) in connection with the beneath positioned transport roller is responsible for the label feed (if printhead is lifted up). The pressure of the supporting bar should be the same as the value for the printhead. The factory setting corresponds to an average for standard labels. For very narrow, extremely smooth or thick labels a different setting is necessary.

Use the threaded pins (B) to change the pressure.

Pressure increase = screw threaded pins (B).

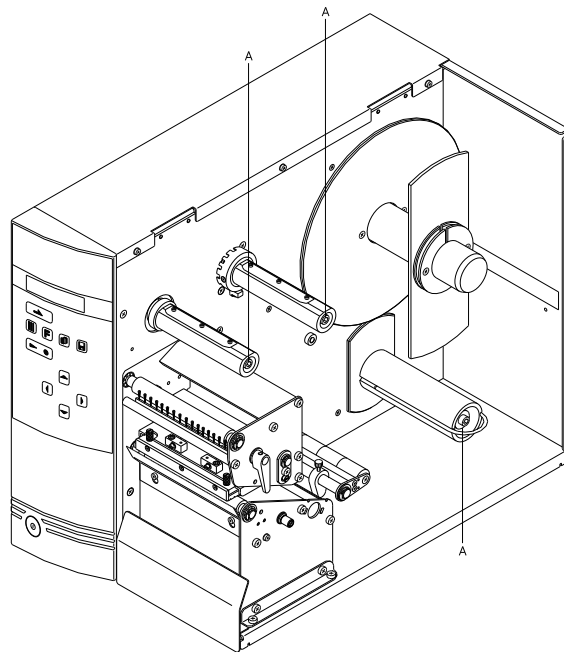**Pressure decrease** = loosen threaded pins (B).

By means of test prints you can adjust the specific pressure you need for your application.

5.11 Oil and Lubricate

NOTICE!

Make sure when oiling and greasing that no lubricants deposit on photocells, electronic components, circuit boards, printhead and rolls.

A = Grease

B = Low viscosity oil
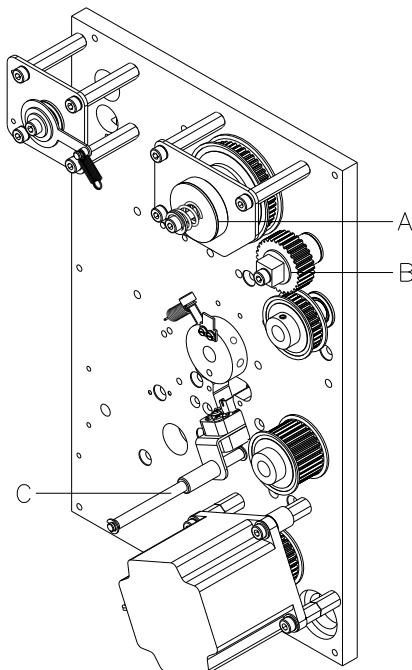
C = Oil   Figure 24

In case that dust or other dirt is deposit you have to clean the lubrication at first with alcohol.

Apply rather in regular intervals (once or twice a per year) a bit of lubricant, as only rarely too much. Otherwise the surplus of lubricant could settle on neighbouring components and disturb the functions.

In case those components should have run it because of lack of lubricant, replace these as soon as possible so the functions of the components and the printer remain.

Install again all components which you have dismantled for the lubrication in the correct position.

Take care e.g. tensions of belt, springs etc.

Figure 25

6   Retrofit with Options

DANGER!

Risk of death via electric shock!

$\Longrightarrow$ Before opening the housing cover, disconnect the label printer from the mains supply and wait for a moment until the power supply unit has discharged.
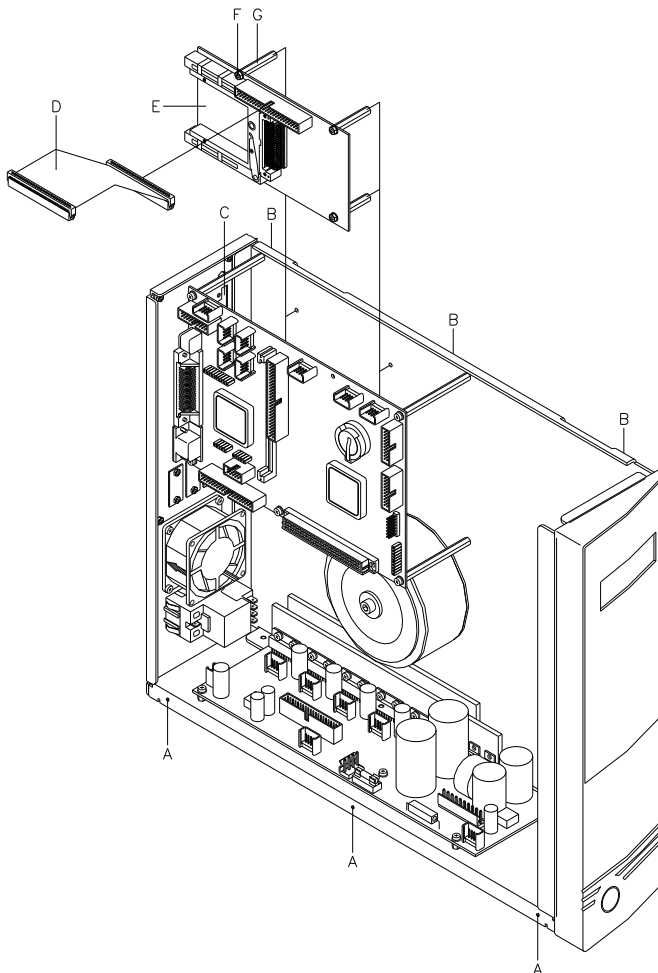
6.1   Memory Card Slot

Figure 26

1.   Remove the left printer cover. Loosen three screws (A) at the lower left printer edge and three screws (B) at the chassis upper edge.

2.   Remove the protective conductor at the inside of the printer cover.

3.   Remove the cover at the breakout (C). The breakout is behind the CPU at height of the Centronics interface.

4.   At the print mechanics side, remove both of the label unwinding disks.

5.   Fix four enclosed distance bolts (G) with the corresponding washers and nuts (F) at the memory card plate.

6.   Insert the connecting cable (D) onto the memory card plate.

7.   Place the pre-assembled memory Card plate (E) behind the CPU and fix it with the enclosed countersink screw at the chassis base.

8.   Insert the connecting cable (D) corresponding to the wiring plan (see chapter 8, page 61), into the appropriate plug-in position ST20 of the CPU.

9.   Connect the protective conductor to the inside of cover.

10.   Mount again the printer cover and label unwinding disks.
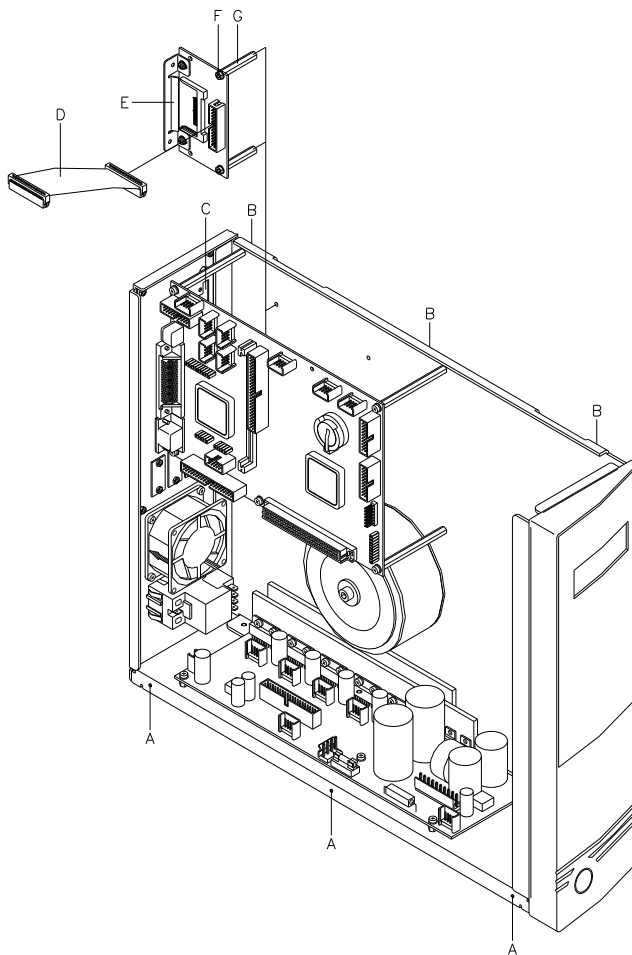
6.2 Compact Flash Card Slot

Figure 27

1. Remove the left printer cover. Loosen three screws (A) at the lower left printer edge and three screws (B) at the chassis upper edge.

2. Remove the protective conductor at the inside of printer cover.

3. Remove the cover at the breakout (C). The breakout is behind the CPU at height of the Centronics interface.

4. At the print mechanics side, remove both of the label unwinding disks.

5. Fix two enclosed distance bolts (G) with the corresponding washers and nuts (F) at the CF card plate.

6. Insert the connecting cable (D) onto CF card plate.

7. Place the pre-assembled CF card plate (E) behind the CPU and fix it with the enclosed countersink screw at the chassis base.

8. Insert the connecting cable (D) corresponding to the wiring plan (see chapter 8, page 61), into the appropriate plug-in position ST26 of the CPU.

9. Connect the protective conductor to the inside of cover.

10. Mount again the printer cover and the label unwinding disks.
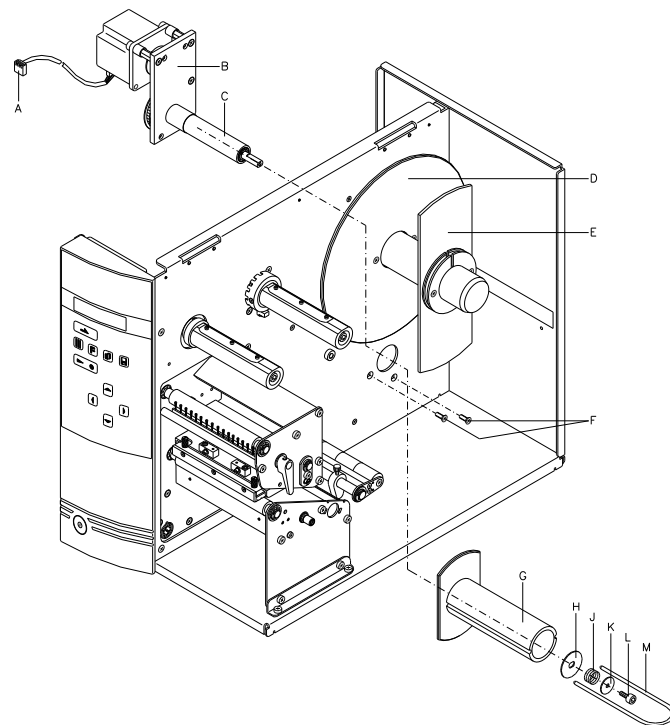
6.3   Internal Rewinder

Figure 28

1. Remove the left printer cover.
   Loosen three screws at the lower left printer edge and three screws at the chassis upper edge.

2. Remove the protective conductor at the inside of the printer cover.

3. At the print mechanics side, remove both of the label unwinding disks (D + E).

4. Unscrew four screws (F) and remove the cover sheet for the rewinder.

5. Push the supporting plate with motor (B) onto the set-up kit from behind through the chassis aperture and fix the rewinder with the countersink screws (F).

6. Insert the motor cable (A) corresponding to the wiring plan (see chapter 8, page 61), into the appropriate plug-in position ST21 of the power supply.

7. Push the rewinding roll (G) onto the tube (C) of the rewinding unit.

8. Push the brake disc (H) with the punching side inwards to the rewinding axe.

9. Push the pressure spring (J) onto the rewinding axe and screw the hex socket head screw (L) with disc (K) as far as it will go. After this loosen the hex socket head screw (L) about 3 turns counter clockwise.

10. Push the handle (M) onto the roll.

11. Connect the protective conductor to the inside of cover.

12. Mount again the printer cover and label unwinding disks.
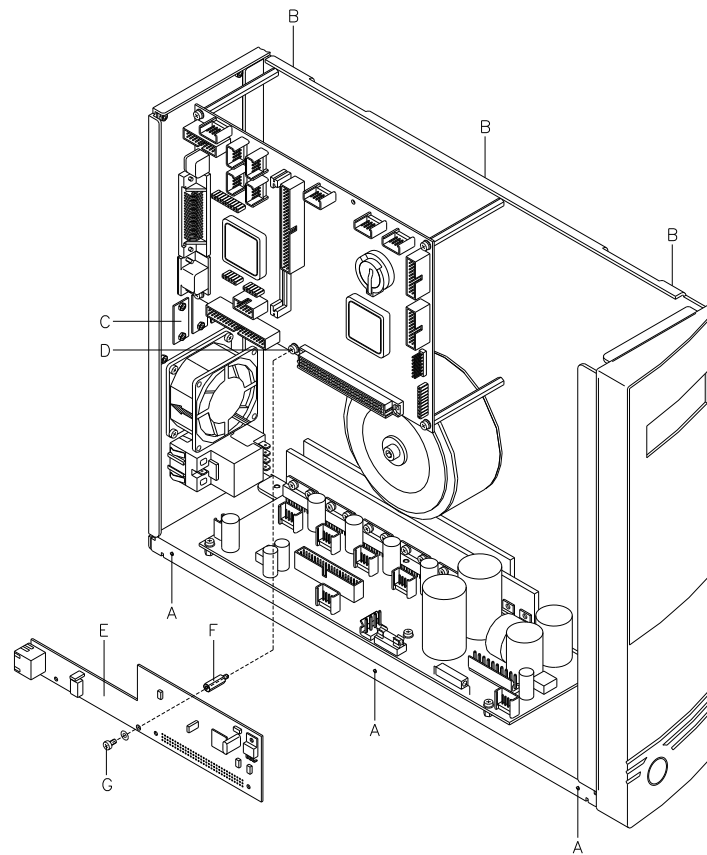
6.4   Ethernet Interface

Figure 29

1. Remove the left printer cover.
   Loosen three screws (A) at the lower left printer edge and three
   screws (B) at the chassis upper edge.

2. Remove the protective conductor at the inside of printer cover.

3. Remove the cover at breakout (C).

4. Unscrew the fixing screws (D) and keep them safe.

5. Screw the distance bolt (F) instead of the screw (D).

6. Place the Ethernet plate (E) in the breakout (C) and insert it into
   the plug-in position ST1 onto the CPU.

7. Fix the plate with the previously removed screw (G) at the
   distance bolt.

8. Connect the protective conductor to the inside of cover.

9. Mount again the left printer cover with screws (A + B).
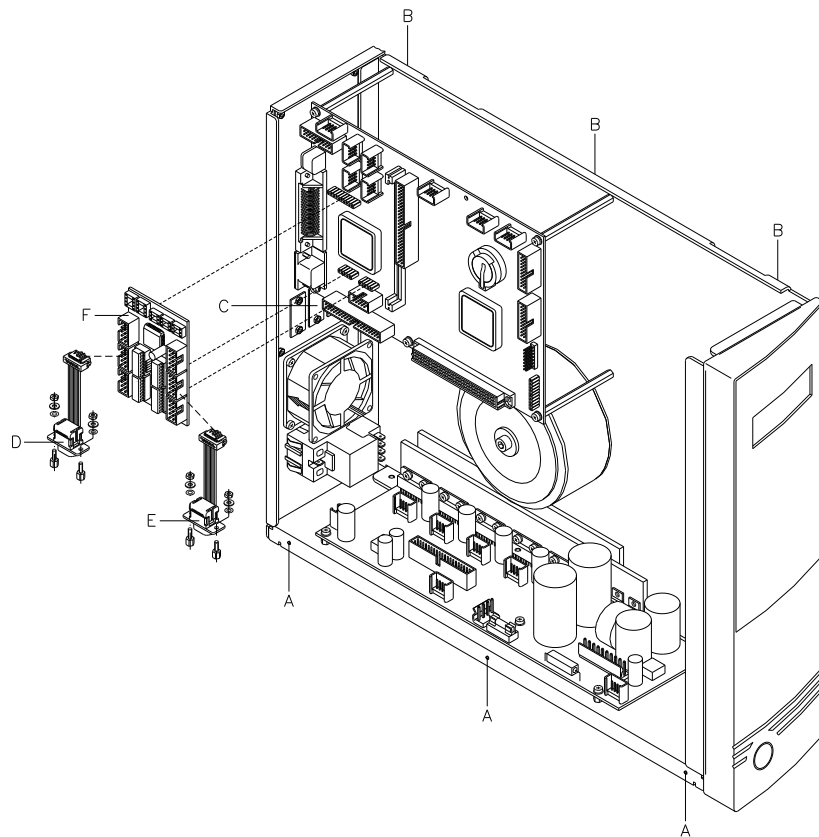
6.5   I/O Plate

Figure 30

1. Remove the left printer cover.
    Loosen three screws at the lower left printer edge (A) and three
    screws (B) at the chassis upper edge.

2. Remove the protective conductor at the inside of printer cover.

3. Remove the covers (C) at the two interface disruptions from the
    chassis rear.

4. Fix the output cable (D) with the 9-pin connector at the back
    disruption.

5. Fix the input cable (E) with the 9-pin connector at the front
    disruption.

6. Place the input/output plate (F) carefully onto the corresponding
    carrier of the CPU.

7. Insert the connecting cables for inputs/outputs corresponding to
    the wiring plan (see chapter 8, page 61) into the appropriate plug-
    in positions of the I/O plate (F).

8. Connect the protective conductor to the inside of printer cover.
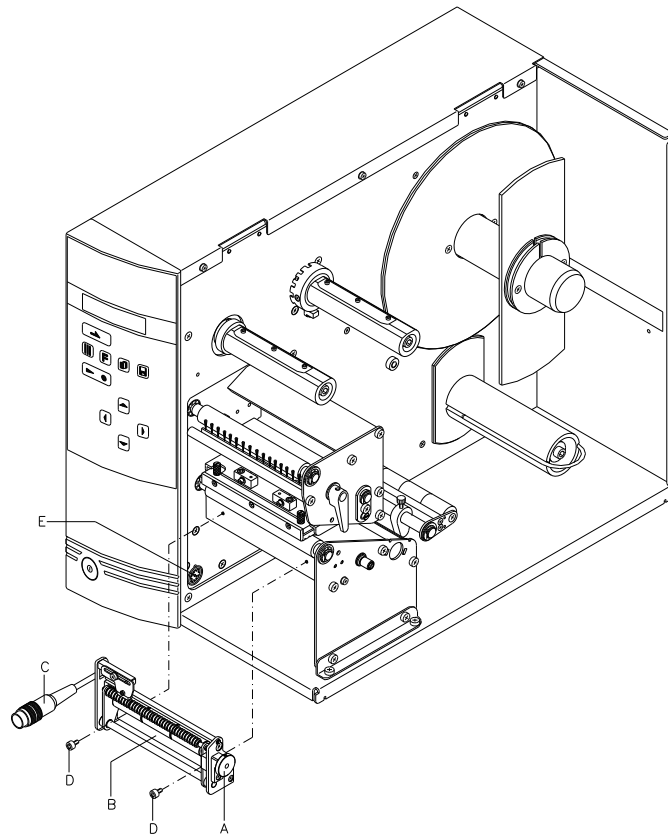
9. Mount again the printer cover.

6.6 Dispenser Unit

Figure 31

Dispenser unit without photocell

1. Remove the tear off edge (if mounted) at the front of printer.

2. For an easier handling, remove the front plate (if mounted) which is fixed at the printer base.

3. Pull the red knurled knob (A) to open the dispenser rocker.

4. Fix the dispenser unit with the hex. head screws (D) at the aluminium profile underneath the pressure roller.

5. Engage again the dispenser rocker.

Dispenser unit with photocell

1. Remove the tear off edge (if mounted) at the front of printer.

2. For an easier handling, remove the front plate (if mounted) which is fixed at the printer base.

3. Pull the red knurled knob (A) to open the dispenser rocker.

4. Place the dispenser unit (B) before the pressure roller. Introduce the photocell cable (C) between the chassis and the left supporting plate of the dispenser downwards.

5. Fix the dispenser unit with the hex. head screws (D) at the aluminium profile beneath the pressure roller.

6. Engage again the dispenser rocker.

7. Insert the plug of photocell cable (C) into the female connector (E) and fasten it.

6.7 Cutter Unit

CAUTION!

Risk of injury, particularly during maintenance, the cutter blades are sharp!

⟹ Switch off the printer before attaching the cutter!

⟹ The cutter may only be used when it is mounted on the printer!

⟹ Do not try to cut any materials which exceed the maximum width or thickness specifications.
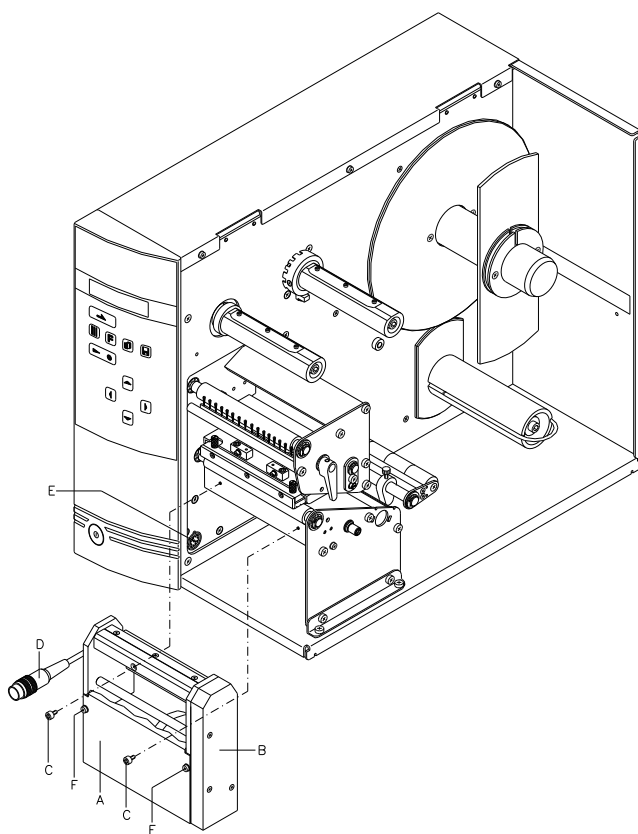
⟹ Do NOT touch the area of the moving blades!

1. Remove the tear-off edge (if mounted) and the fixing screws at the printer front.

2. Remove the front plate (if mounted) which is fixed at the printer base.

3. If pre-assembled, remove the front plate (A) of cutting unit (B).

4. Hold the cutting unit slightly inclined on the right side in front of the pressure roller so that the threaded holes of the aluminium profile have approximately the same height as the through holes at the cutting unit.

5. Press the cutting unit backwards at the left side.

6. Fix the cutting unit with the screws (C) at the aluminium profile.

7. Insert the plug of cable (D) into the female connector (E) and fasten it.

8. Fix the front plate (A) with the screws (F) at the side panels of the cutting unit. Make sure that the front plate with the upper short chamfer in the slot is placed between the cutter blade and the square pillar.

Figure 32

6.8   Guiding for Leporello Fold Material
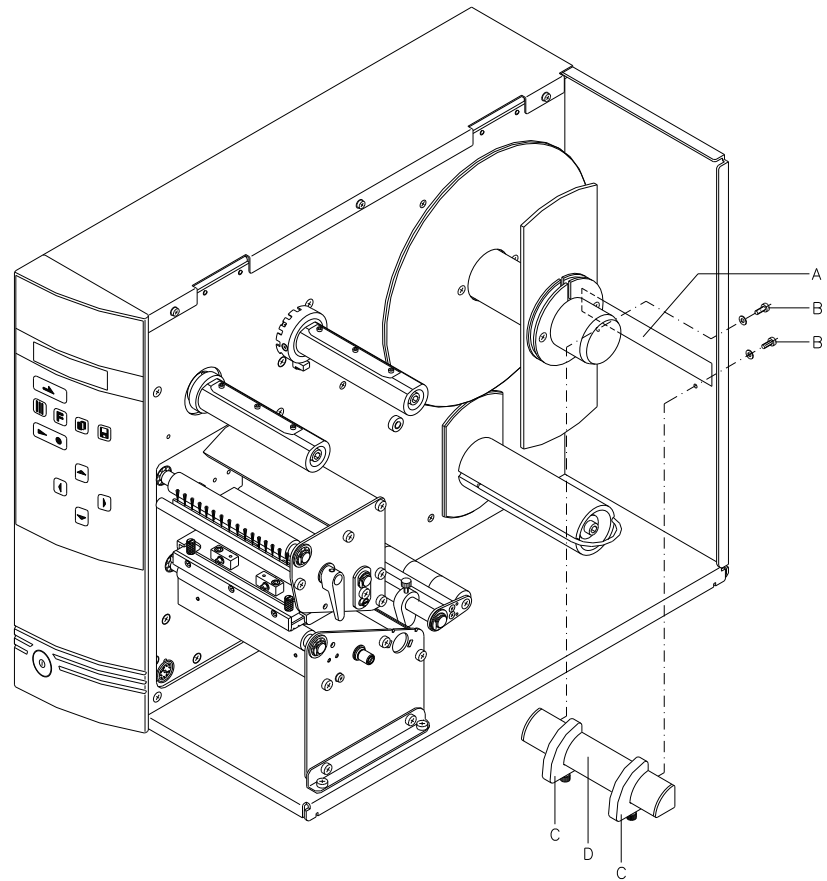
Figure 33

At the printer rear you can find a breakout (A) for externally supplied label material.

1.   Place the setup-kit for Leporello guiding (D) as illustrated above in front of the breakout.

2.   Fix the Leporello guiding with the enclosed screws (B) and slot nuts at the rear.

3.   Adjust the label guiding (C) according to material width.

4.   The supplied label material should be aligned as parallel as possible to the centre panel of the printer.

7   Error Correction

Error message	Cause	Remedy
1 Line too high	Line rises up completely or partly over the upper edge of label.	Move line down (increase Y value). Check rotation and font.
2 Line too low	Line rises up completely or partly over the bottom edge of label.	Move line up (reduce Y value). Check rotation and font.
3 Character set	One res. several characters of the text is res. are not available in the selected font.	Change text. Change font.
4 Unknown BC type	Selected code is not available.	Check code type.
5 Illegal rotation	Selected rotation is not available.	Check rotation.
6 CV font	Selected font is not available.	Check font.
7 Vector font	Selected font is not available.	Check font.
8 Measuring label	While measuring no label was found. Set label length is too large.	Check label length and if labels are inserted correctly. Restart measuring anew.
9 No label found	No label available. Soiled label photocell. Labels not inserted correctly.	Insert new label roll. Check if labels are inserted correctly. Clean the label photocell.
10 No ribbon	During the print order the ribbon roll becomes empty. Defect at the transfer ribbon photocell.	Change transfer ribbon. Check transfer ribbon photocell (service functions).
11 COM FRAMING	Stop bit error.	Check stop bits. Check baud rate. Check cable (printer and PC).
12 COM PARITY	Parity error.	Check parity. Check baud rate. Check cable (printer and PC).
13 COM OVERRUN	Loss of data at serial interface (RS-232).	Check baud rate. Check cable (printer and PC).

Error message	Cause	Remedy
14 Field number	Received line number is invalid.	Check sent data. Check connection PC - printer.
15 Length mask	Invalid length of received mask statement.	Check sent data. Check connection PC - printer.
16 Unknown mask	Transferred mask statement is invalid.	Check sent data. Check connection PC - printer.
17 Missing ETB	No end of data found.	Check sent data. Check connection PC - printer.
18 Invalid character	One res. several characters of the bar code is res. are not valid.	Change bar code data. Change font.
19 Invalid statement	Unknown transferred data record.	Check sent data. Check connection PC - printer.
20 Invalid check digit	For check digit control the entered res. received check digit is wrong.	Calculate check digit anew. Check code data.
21 Invalid SC code	Selected SC factor is invalid for EAN res. UPC.	Check SC factor.
22 Invalid number of digits	Entered digits for EAN res. UPC are invalid < 12; > 13.	Check number of digits.
23 Type check digit	Selected check digit calculation is not available in the bar code.	Check calculation of check digit. Check bar code type.
24 Invalid extension	Selected zoom factor is not available.	Check zoom factor.
25 Offset sign	Entered sign is not available.	Check offset value.
26 Offset value	Entered offset value is invalid.	Check offset value.
27 Printhead temperature	Printhead temperature is too high. Defective printhead sensing device.	Reduce contrast. Change printhead.
28 Cutter error	With cut an error occurred. Paper jam.	Check label run. Check cutter run.
29 Invalid parameter	Entered data do not correspond to the characters allowed from the application identifier.	Check code data.

Error message	Cause	Remedy
30 Application Identifier	Selected application identifier is not available in GS1-128.	Check code data.
31 HIBC definition	Missing HIBC system sign. Missing primary code.	Check definition of HIBC code.
32 System clock	Real Time Clock function is selected but the battery is empty. Defective RTC.	Change battery. Change RTC component.
33 No CF interface	Interrupted connection CPU - CF card. Defective CF card interface.	Check connection CPU - CF card interface. Check CF card interface.
34 No print memory	Not enough print memory available.	Check CF assembly on CPU.
35 Printhead open	At start of a print order the printhead is open.	Close the printhead and start print order anew.
36 BCD invalid format	BCD error Invalid format for the calculation of Euro variable.	Check entered format.
37 BCD overflow	BCD error Invalid format for the calculation of Euro variable.	Check entered format.
38 BCD division	BCD error Invalid format for the calculation of Euro variable.	Check entered format.
39 FLASH ERROR	Flash component error.	Run a software update. Change CPU.
40 Length command	Invalid length of the received command statement.	Check data sent. Check connection PC - printer.
41 No drive	CF card not found / not correctly inserted.	Insert CF card correctly.
42 Drive error	Impossible to read CF card (faulty).	Check CF card, if necessary change it.
43 Unformatted	CF Card not formatted.	Format CF card.
44 Delete directory	Attempt to delete the actual directory.	Change directory.
45 Invalid path	Too long indication of path.	Indicate a shorter path.

Error message	Cause	Remedy
46 Drive write-protected	Memory card is write-protected.	Deactivate write protection.
47 Directory not file	Attempt to indicate a directory as file name.	Correct your entry.
48 File already open	Attempt to change a file during an access is active.	Select another file.
49 No file/directory	File does not exist on CF card.	Check file name.
50 Invalid file name	File name contains invalid characters.	Correct entry of name, remove special characters.
51 Internal file error	Internal file system error.	Please contact your distributor.
52 Root full	The max. number (64) of main directory entries is reached.	Delete at least one main directory entry and create subdirectories.
53 Drive full	Maximum CF capacity is reached.	Use new CF Card, delete no longer required files.
54 File/directory exists	The selected file/directory already exists.	Check name, select a different name.
55 File too large	During copying procedure not enough memory space onto target drive available.	Use a larger target card.
56 No update file	Errors in update file of firmware.	Start update file anew.
57 Invalid graphic file	The selected file does not contain graphic data.	Check file name.
58 Directory not empty	Attempt to delete a not empty directory.	Delete all files and sub-directories in the desired directory.
59 No CF interface	No CF card drive found.	Check connection of CF card drive. Contact your distributor
60 No media	No CF card is inserted.	Insert CF card in the slot.
61 Webserver error	Error at start of web server.	Please contact your distributor.
62 Wrong PH FPGA	The direct printing system is equipped with the wrong FPGA.	Please contact your distributor.
63 End position	The label length is too long. The number of labels per cycle is too much.	Check label length res. the number of labels per cycle.

Error message	Cause	Remedy
64 Zero point	Defective photocell.	Change photocell.
65 Compressed air	Pressure air is not connected.	Check pressure air.
66 External release	External print release signal is missing.	Check input signal.
67 Column too wide	Wrong definition of column width res. number of columns.	Reduce the column width res. correct the number of columns.
68 Scanner	The connected bar code scanner signals a device error.	Check the connection scanner/printer. Check scanner (dirty).
69 Scanner NoRead	Bad print quality. Printhead completely soiled or defective. Print speed too high.	Increase contrast. Clean printhead or replace (if necessary). Reduce print speed.
70 Scanner data	Scanned data does not correspond to the data which is to print.	Replace printhead.
71 Invalid page	As page number either 0 or a number > 9 is selected.	Select a number between 1 and 9.
72 Page selection	A page which is not available is selected.	Check the defined pages.
73 Undefined page	The page is not defined.	Check the print definition.
74 Format user guiding	Wrong format for customized entry.	Check the format string.
75 Format date/time	Wrong format for date/time.	Check the format string.
76 Hotstart CF	No CF card found.	If option hotstart was activated, a CF card must be inserted. Switch off the printer before inserting the memory card.
77 Flip/Rotate	Selection of print of several columns and also mirror/rotate.	It is only possible to select one of both functions.
78 System file	Loading of temporary hotstart files.	Not possible.
79 Shift variable	Faulty definition of shift times (overlapping times).	Check definition of shift times.
80 GS1 Databar	General GS1 Databar error.	Check definition and parameter of GS1 Databar code.
81 IGP error	Protocol error IGP.	Check sent data.

Error message	Cause	Remedy
82 Time generation	Printing creation was still active at print start.	Reduce print speed. Use printers' output signal for synchronization. Use bitmap fonts to reduce generating time.
83 Transport protection	Both DPM position sensors (start/end) are active.	Displace zero point sensor Check sensors in service functions menu
84 No font data	Font and web data is missing.	Run a software update.
85 No layout ID	Layout ID definition is missing.	Define layout ID onto the label.
86 Layout ID	Scanned data does not correspond to defined ID.	Wrong label loaded from CF card.
87 RFID no label	RFID unit cannot recognize a label.	Displace RFID unit or use an offset.
88 RFID verify	Error while checking programmed data.	Faulty RFID label. Check RFID definitions
89 RFID timeout	Error at programming the RFID label.	Label positioning. Faulty label.
90 RFID data	Faulty or incomplete definition of RFID data.	Check RFID data definitions.
91 RFID tag type	Definition of label data does not correspond with the used label.	Check storage partitioning of used label type
92 RFID lock	Error at programming the RFID label (locked fields).	Check RFID data definitions. Label was already programmed.
93 RFID programming	Error at programming the RFID label.	Check RFID definitions.
94 Scanner timeout	The scanner could not read the bar code within the set timeout time.	
	Defective printhead. Wrinkles in transfer ribbon. Scanner wrong positioned. Timeout time too short.	Check printhead. Check transfer ribbon. Position scanner correctly, corresponding to the set feeding. Select longer timeout time.

Error message	Cause	Remedy
95 Scanner layout difference	Scanner data does not correspond to bar code data.	Check adjustment of scanner. Check scanner settings / connection.
96 COM break	Serial interface error.	Check settings for serial data transmission as well as cable (printer-PC).
97 COM general	Serial interface error.	Check settings for serial data transmission as well as cable (printer-PC).
98 No software printhead FPGA	No printhead-FPGA data available.	Please contact your responsible distributor.
99 Load software printhead FPGA	Error when programming printhead-FPGA.	Please contact your responsible distributor.
100 Upper position	Option applicator: Sensor signal up is missing.	Check input signals / compressed-air supply.
101 Lower position	Option applicator: Sensor signal down is missing.	Check input signals / compressed-air supply.
102 Vacuum plate empty	Option applicator: Sensor does not recognize a label at vacuum plate.	Check input signals / compressed-air supply.
103 Start signal	Print order is active but device not ready to process it.	Check start signal.
104 No print data	Print data outside the defined label. Selection of wrong module type (design software).	Check selected module type. Check selection of left/right version.
105 Printhead	No original printhead is used.	Check the used printhead. Contact your distributor.
106 Invalid Tag type	Wrong Tag type. Tad data do not match the Tag type in the printer.	Adapt data or use the correct Tag type.
107 RFID inactive	RFID module is not activated. No RFID data can be processed.	Activate RFID module or remove RFID data from label data.
108 GS1-128 invalid	Transferred GS1-128 bar code is invalid.	Verify bar code data (see GS1-128 bar code specification).
109 EPC parameter	Error at EPC calculation.	Verify data (see EPC specification).

Error message	Cause	Remedy
110 Housing open	When starting the print order the housing cover is not closed.	Close the housing cover and start the print order anew.
111 EAN.UCC code	Transferred EAN.UCC code is invalid.	Verify bar code data (see corresponding specification).
112 Print carriage	Printing carriage does not move.	Check gear belt (possibly broken).
113 Applicator error	Option applicator: Error while using applicator.	Check applicator.
114 Left position	Option applicator: Left final position switch is not in correct position.	Check LEFT final position switch for correct function and position. Check function of pneumatics for cross traverse.
115 Right position	Option applicator: Right final position switch is not in correct position.	Check RIGHT final position switch for correct function and position. Check function of pneumatics for cross traverse.
116 Print position	Option applicator: The applicator is not in the print position when trying to print a label.	Check TOP and RIGHT final position switch for correct function and position. Check pneumatics for function
117 XML parameter	The parameters in the XML file are not correct.	Please contact your responsible distributor.
118 Invalid variable	Transferred variable is invalid with customized entry.	Select correct variable without customized entry and transfer it.
119 No ribbon	During the print order the ribbon roll becomes empty. Defect at the transfer ribbon photocell.	Change transfer ribbon. Check transfer ribbon photocell (service functions).
120 Wrong directory	Invalid target directory when copying.	Target directory must not be within the source directory. Check target directory.
121 No label PH2	No label found at the rear printhead (DuoPrint). Soiled label photocell. Labels not inserted correctly.	Insert new label roll. Clean the label photocell. Check if labels are inserted correctly.
122 IP occupied	The IP address was already assigned.	Assign a new IP address.

Error message	Cause	Remedy
123 Print asynchronous	The label photocell do not work in the order as it is expected according to print data.	Check label size and gap size.
	The settings of the photocell are not correct.	Check label photocell settings.
	Settings of label size and gap size are not correct.	Check correct loading of label material.
	No label found at the rear printhead.	Insert new label roll.
	Soiled label photocell.	Clean the label photocell.
	Labels not inserted correctly.	Check if labels are inserted correctly.
124 Print too low	The print speed is too slow.	Increase the speed of the customers' machine.
125 DMA buffer	Communication problem HMI.	Restart the printer.
126 UID conflict	Configuration RFID programming faulty.	Run RFID initialising.
127 Module not found	RFID module not available.	Check the RFID module connection.
		Please contact your responsible distributor.
128 No release signal	No print release by higher-level control (customer machine).	Activate release signal at the higher-level control.
129 Wrong firmware	Firmware does not match the used printer type.	Use firmware that fits to the printer type.
		Please contact your responsible distributor.
130 Language missing	Language file for the set printer language is not available.	Please contact your responsible distributor.
131 Wrong material	Label material does not fit to printing data.	User label material with suitable label and/or gap length.
132 Invalid mark-up tag	Invalid mark-up formatting characters in text.	Correct the formatting characters in the text.
133 Script not found	LUA script file not found.	Check the file name.

Error message	Cause	Remedy
134 Script failure	LUA script is incorrect.	Check the script.
135 Script user error	Error in LUA script user input.	Correct the input value.
136 No reprint available	No label data for reprinting available.	Send new label data to the printer.
137 Printhead short circuit	Electrical short at the printhead.	Check the used printhead. Please contact your distributor.
138 Too less ribbon	Transfer ribbon ends.	Change transfer ribbon.
139 Hardware error	A hardware component could not be found.	Please contact your responsible distributor.

8   Control Inputs and Outputs

8.1   Option I

Control outputs

Via signal outputs various operating modes of the printer can be demanded.

The signal outputs are made available vial two 9-pin D-Sub-sockets (Output 1) at the rear of the Control Unit. They consist of opto-integrator semiconductor lines which are switched through res. blocked out corresponding to the different operating modes.

In case a control output is active, then the corresponding output is to strain with a maximum current of 30mA.
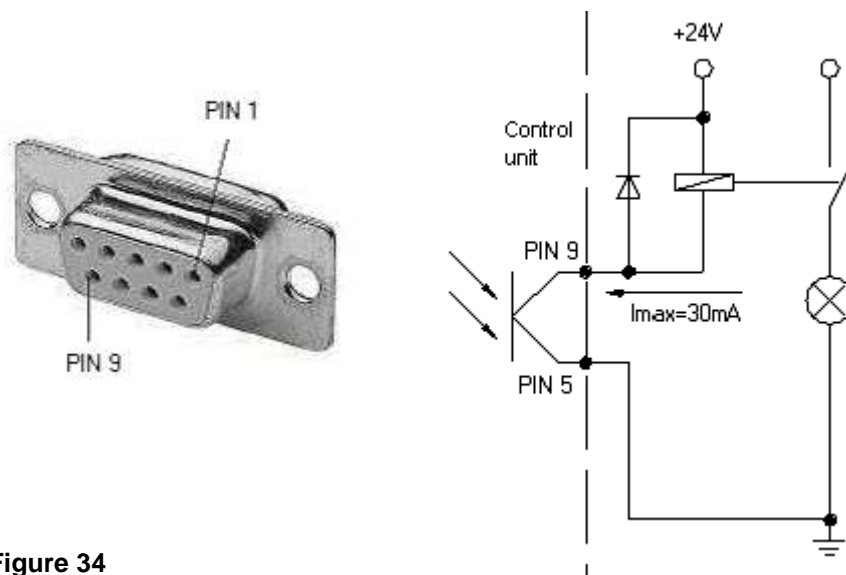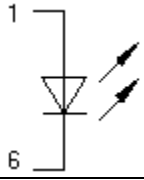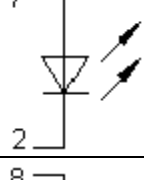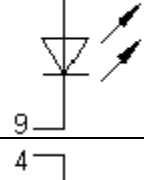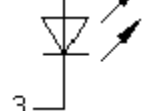
Figure 34

PIN (socket)	Output I
9 / 5	Out 1: Error message Each error status such as ribbon error is displayed.
8 / 7	Out 2: Print order The printer was activated with a print order. Now print start by IN1 is possible.
6 / 2	Out 3: Label generation The printer is filled with current label data. In case in dispenser mode either dispenser photocell or dispenser photocell continuous is selected it is indicated if a label is under photocell and ready to pick up.
4 / 3	Out 4: Single print The content of printer memory is printed to the corresponding medium by printhead.

Control inputs   Via the control input the print start signal is lead to the control unit.
                            The control input is electroplated separated and has to be provided
                            with an external voltage source. The signal level is active "HIGH".
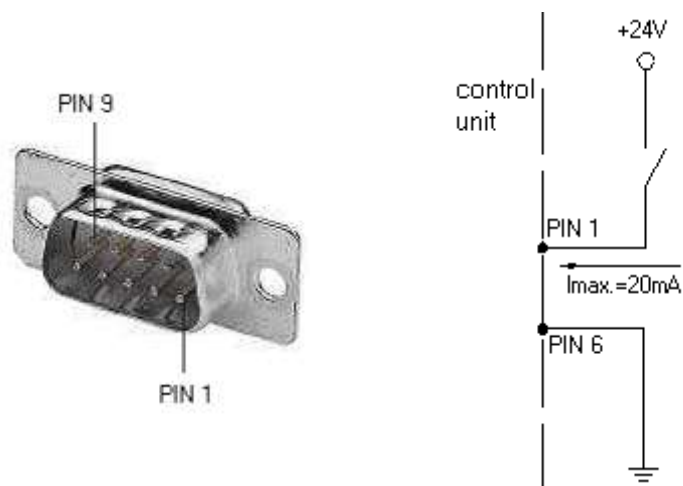
Figure 35

PIN	Input I	Input II
	In 1: cutter mode = cut is activated dispenser mode = print start	In 5: Not used
	In 2: Not used	In 6: Not used
	In 3: Not used	In 7: Not used
	In 4: Not used	In 8: Not used

8.2   Option II

For special applications, an I/O plate with 24 V supply and special options is available.

Back view of I/O connector.
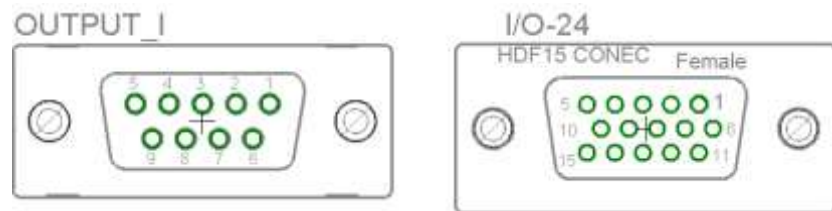
Output I is identical to option I.
The I/O-24 connector is 15-pole and provides user-sided 24 V for pins 5 and 10 for supplying the sensors (max. 200 mA).
Pin 1, 6 and 11 are equipped with GND. In case of using I/O-24 signals, exist no galvanic separation.

The other connection possibilities of I/O-24 connector can be noticed from the below switching examples.

Example 1:

Switching example for creating a start signal by a sensor with NPN output.

Example 2:

Switching example for creating a start signal by a sensor with PNP output.

Example 3:

Switching example for creating a start signal by a potential-free contact.

Connecting a signal lamp at error output (24 V / max. 200mA).
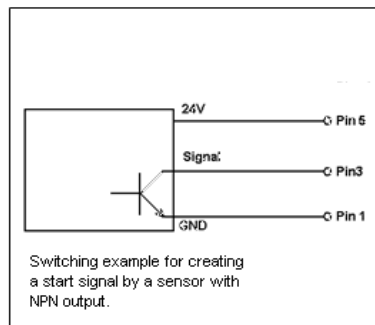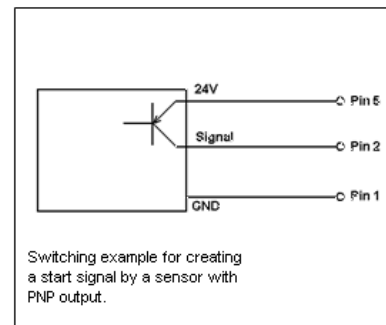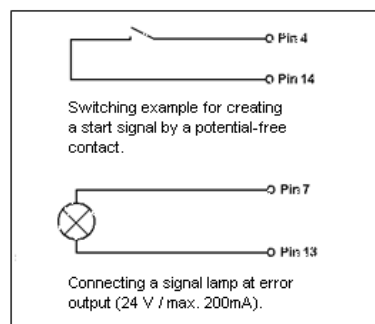
9   Wiring Plan

**Spectra 107, 108,
160, 162**
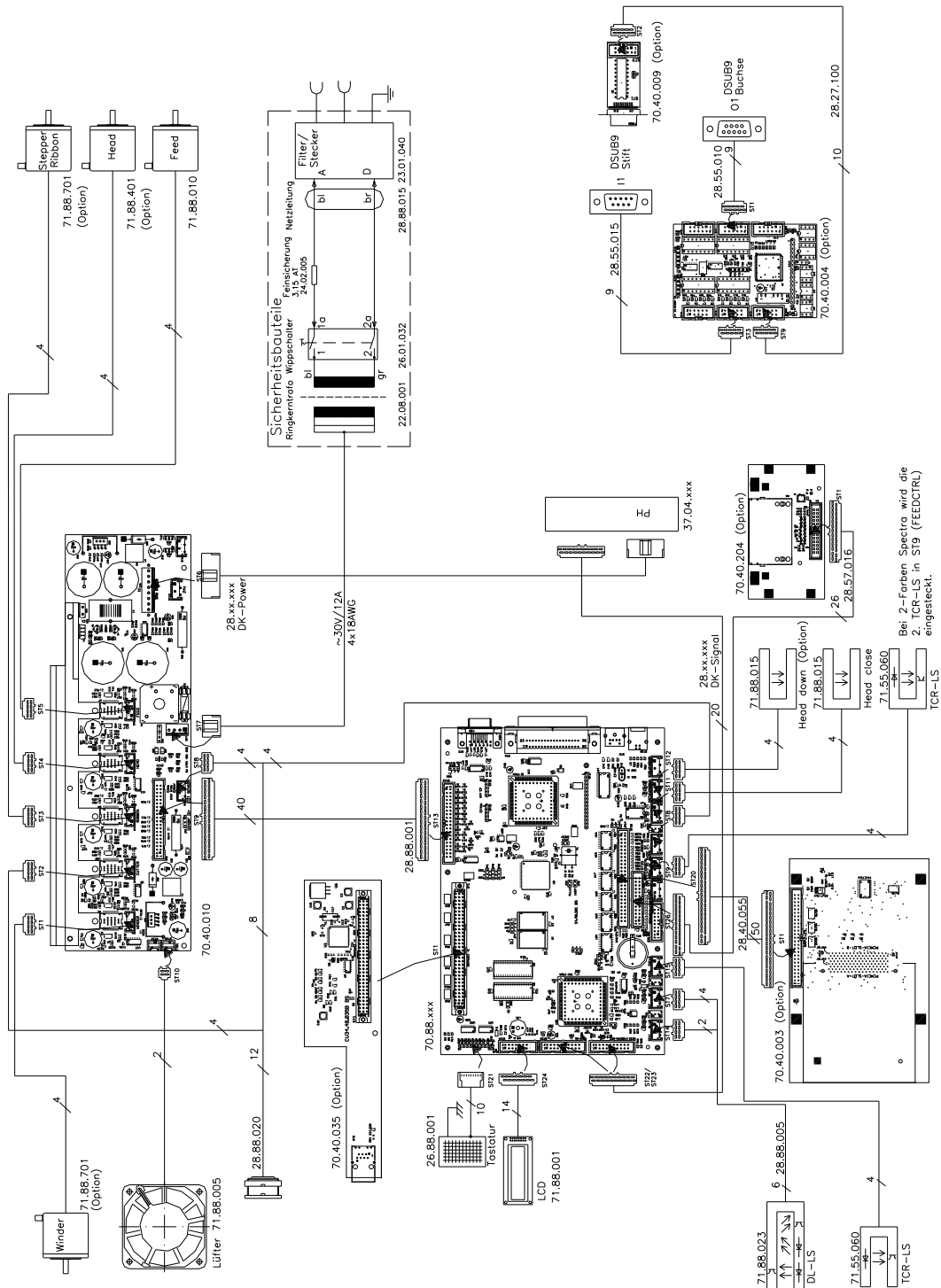
Figure 36

Spectra 216
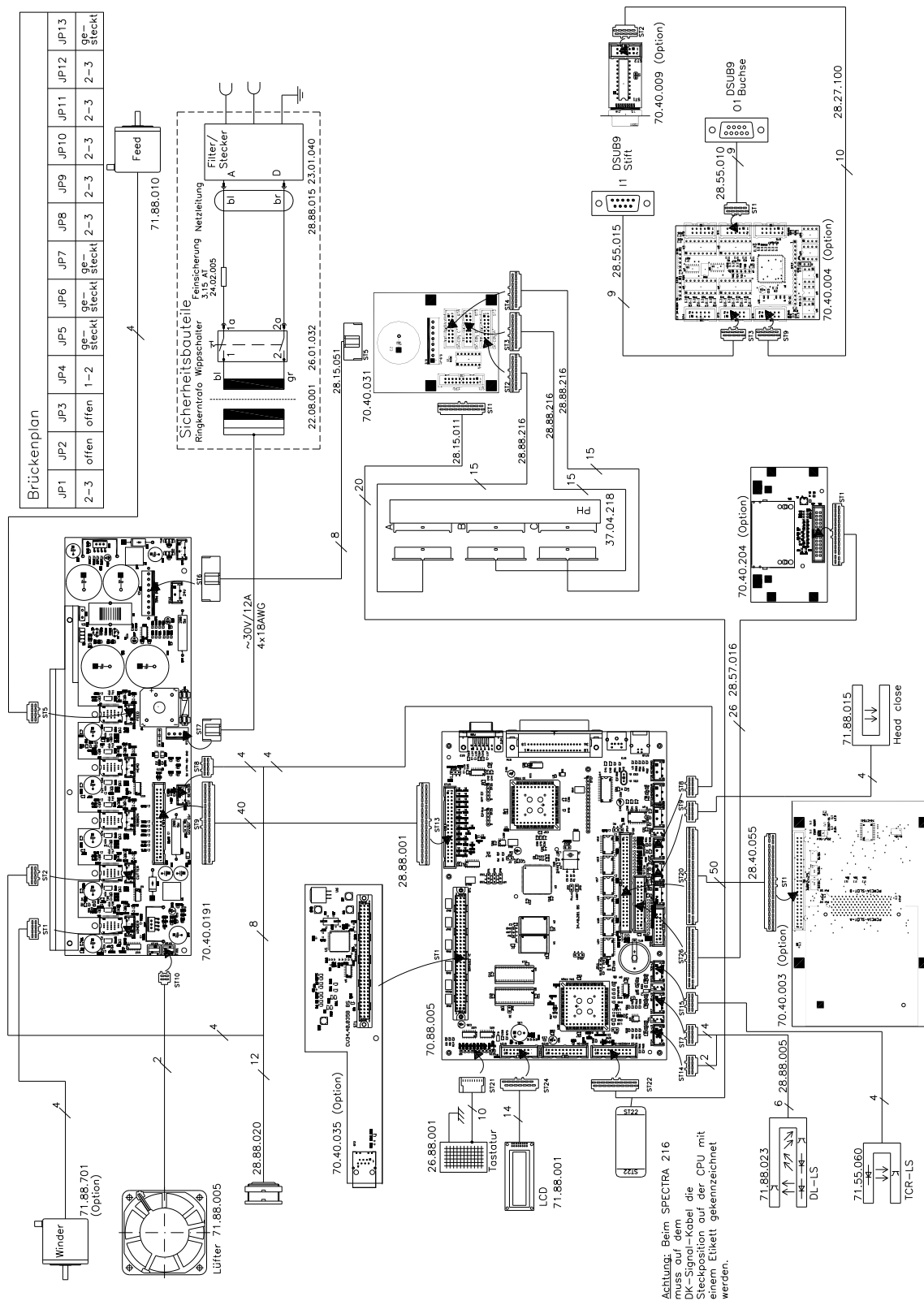
Figure 37

10 Layout Diagrams

10.1 CPU
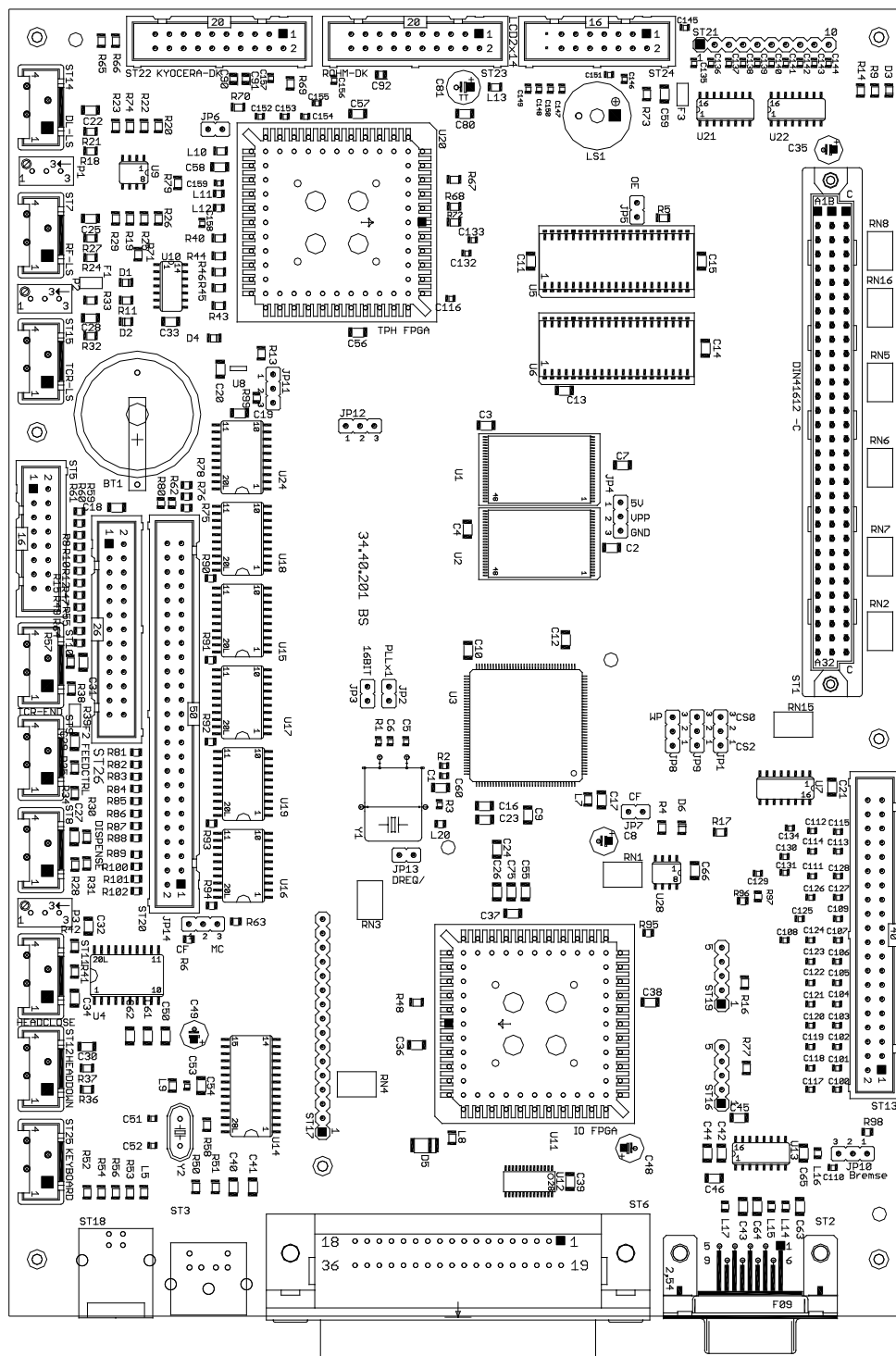
Figure 38

Jumper plan for Spectra 107, 108, 160, 162

	JP1	JP2	JP3	JP4	JP5	JP6	JP7
BOOT	1-2	open	closed	1-2	closed	open	open
STANDARD	2-3	open	open	1-2	closed	open	closed*

	JP8	JP9	JP10	JP11	JP12	JP13	JP14
BOOT	1-2	1-2	-	1-2	1-2	open	open
STANDARD	2-3	2-3	2-3	1-2	1-2	open	1-2*

Jumper plan for Spectra 216

	JP1	JP2	JP3	JP4	JP5	JP6	JP7
BOOT	1-2	open	closed	1-2	closed	open	open
2 charging circuits	2-3	open	open	1-2	closed	closed	closed *

	JP8	JP9	JP10	JP11	JP12	JP13	JP14
BOOT	1-2	1-2	-	1-2	1-2	open	open
2 charging circuits	2-3	2-3	2-3	2-3	2-3	closed	1-2*

> **ℹ NOTICE!**
>
> If PCMCIA interface is used, JP7 open and JP14 2-3

Component overview

P1	Sensibility label photocell transmission
P2	Sensibility label photocell reflexion
P3	Sensibility dispenser photocell
U1; U2	FLASH component
U3	32 bit RISC processor
U5; U6	DRAM
U8	RESET component
U10	RTC (Real Time Clock)
U11	INPUT/OUTPUT FPGA
U13	RS-232 component
U14	USB (Universal Serial Bus) component
U20	Printhead FPGA
U28	serial EEPROM

Plug-in positions

ST1	Bus male connector (option ETHERNET)
ST7	Label photocell reflexion
ST8	Dispenser photocell (option)
ST11	Printhead open/closed
ST12	Ribbon save photocell (option)
ST13	Connection to power unit
ST14	Label photocell transmission
ST15	Ribbon control
ST16, 17, 19	DISPENSING I/O, RS-485, RS-422 (option)
ST20	MEMORY CARD - PCMCIA (option)
ST21	Foil keyboard
ST22	Printhead KCE107/12 or KCE 160/12
ST23	Printhead RH108/12 or RH162/12
ST24	LCD
ST26	MEMORY CARD - Compact Flash (option)

10.2 Power Supply Unit (Revision G)
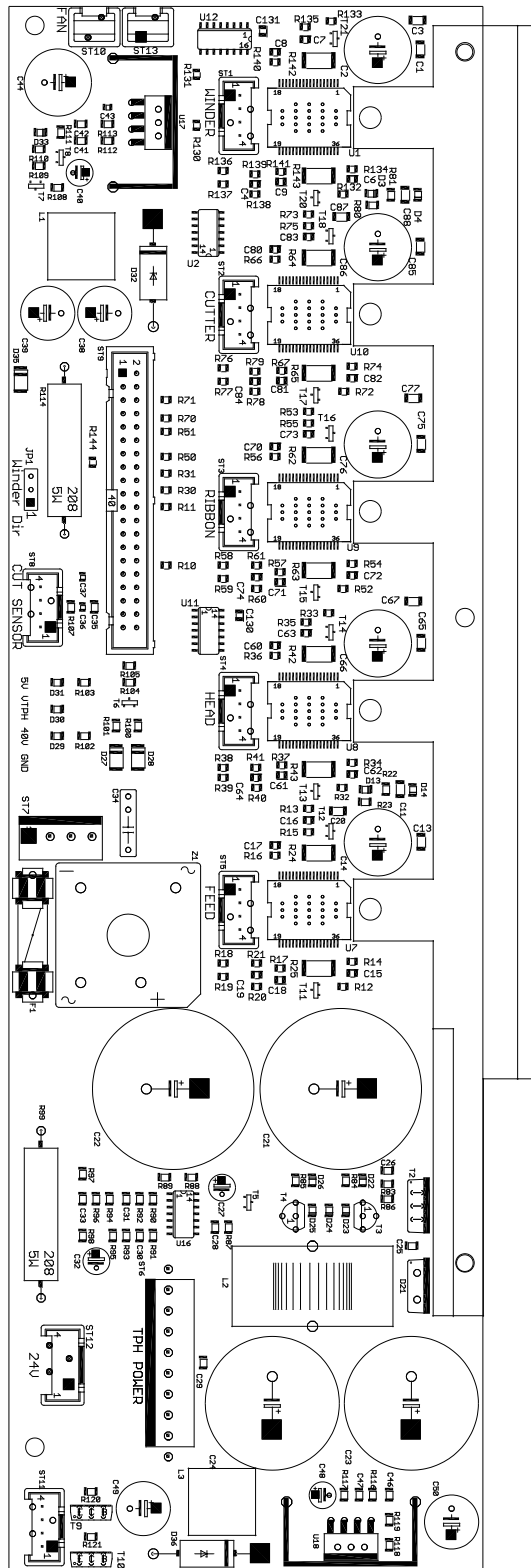
Figure 39

Component overview	U1	Motor driver 'internal winder' (option)
	U7	Motor driver feed motor
	U8	Motor driver ribbon save motor (option)
	U9	Motor driver ribbon motor (option ribbon save)
	U10	Motor driver cutter motor (option)
	U16	Control component printhead heater voltage
	U17	Voltage control 5V
	U18	Voltage control 24V
	Z1	Bridge rectifier
	F1	Secondary fuse 10A/T
	T2	P circuit MOS-FET 100V/50A printhead voltage

Plug-in positions	ST1	Motor plug 'internal winder' (option)
	ST2	Motor plug cutter motor (option)
	ST3	Motor plug ribbon motor (option ribbon save)
	ST4	Motor plug ribbon save motor (option)
	ST5	Motor plug feed motor
	ST6	Heater voltage printhead
	ST7	Toroidal transformer
	ST8	Cutter photocell (option)
	ST9	Connection CPU
	ST10, 13	Fan
	ST11	Valve/Brake
	ST12	24V

Measuring points	5V	Voltage for CPU (VCC)
	24V	Heater voltage printhead (VDK)
	40V	Input voltage (VIN)
	GND	Mass

10.3 Memory Card Slot (Option)
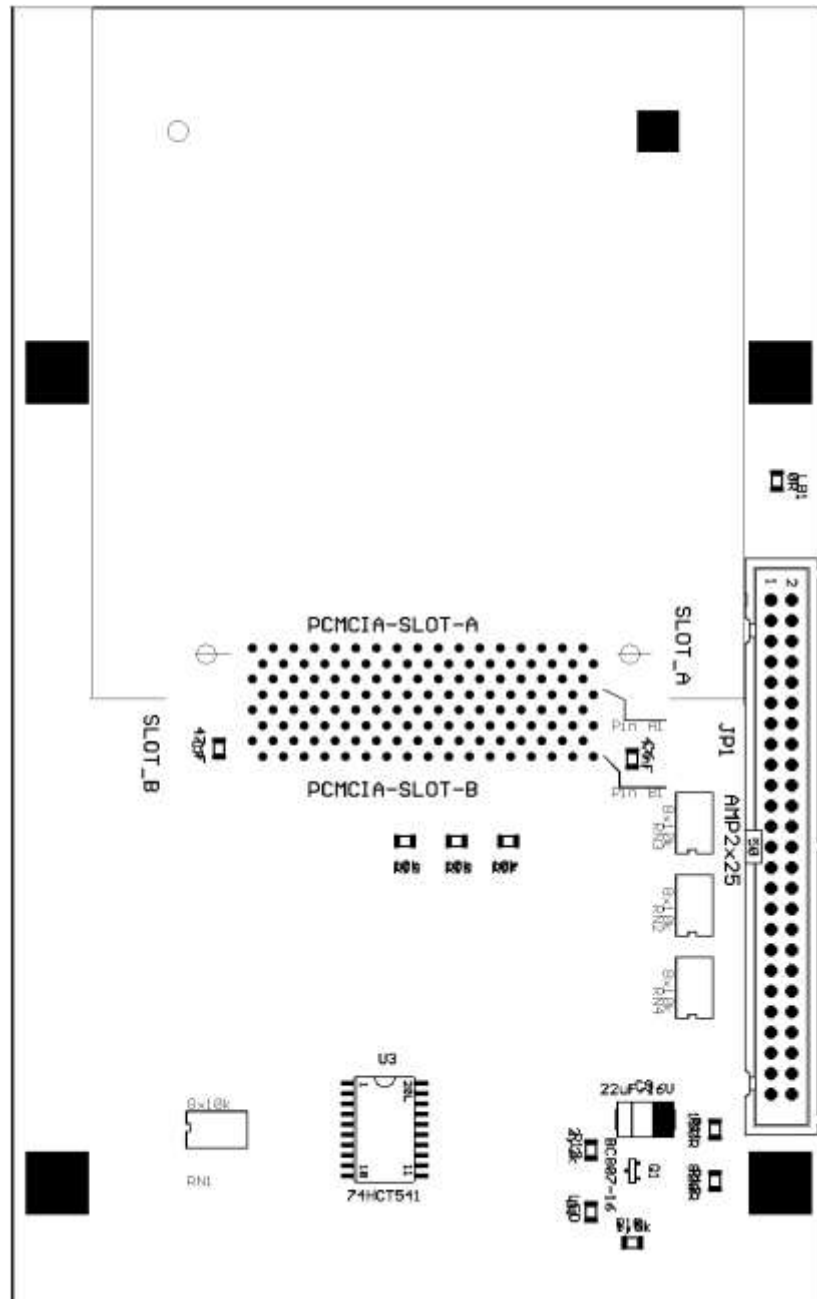
Figure 40

| **Component overview** | U3 | Data bus driver |
| | Q1 | Switching transistor for memory card voltage |

| **Plug-in positions** | JP1 | Connection CPU |

10.4 Compact Flash Card Slot (Option)
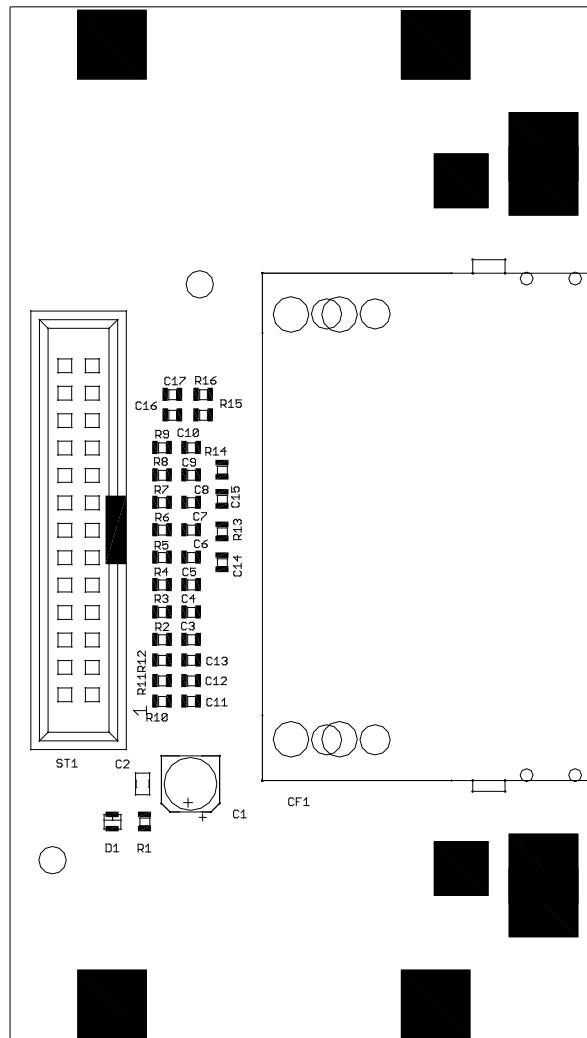
Figure 41

Plug-in positions   STP1   Connection CPU

10.5 Input/Output Board (Option)
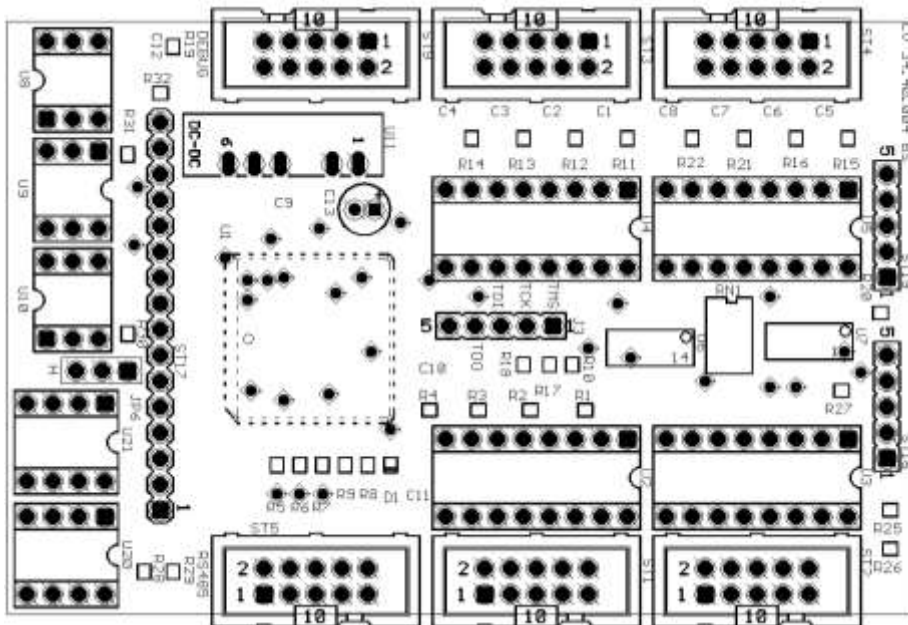
Figure 42

Jumper plan

ℹ **NOTICE!**

Only valid for complete equipped I/O board.

Function	Jumper position JP6
RS-422 full duplex	2-1
RS-485 half duplex	2-3

Component overview

U1	EPLD component
U2	Optocoupler outputs 1-4 (Output1)
U3	Optocoupler outputs 5-8 (Output2)
U4	Optocoupler inputs 1-4 (Input1)
U5	Optocoupler inputs 5-8 (Input2)
U6	Driver inputs
U7	Driver RS-422 / RS-485
U8	Optocoupler DTR/DIR
U9	Optocoupler TXD1
U10	Optocoupler RXD1
U11	Voltage transformer 5V ±5V
U20, 21	Interface components RS-422 / RS-485

Plug-in positions

ST1	Outputs 1-4 (Output1)
ST2	Outputs 5-8 (Output2)
ST3	Inputs 1-4 (Input1)
ST4	Inputs 5-8 (Input2)
ST5	RS-485 / RS-422
ST16, 17, 19	Connection CPU

10.6 Input/Output Board 24V (Option)
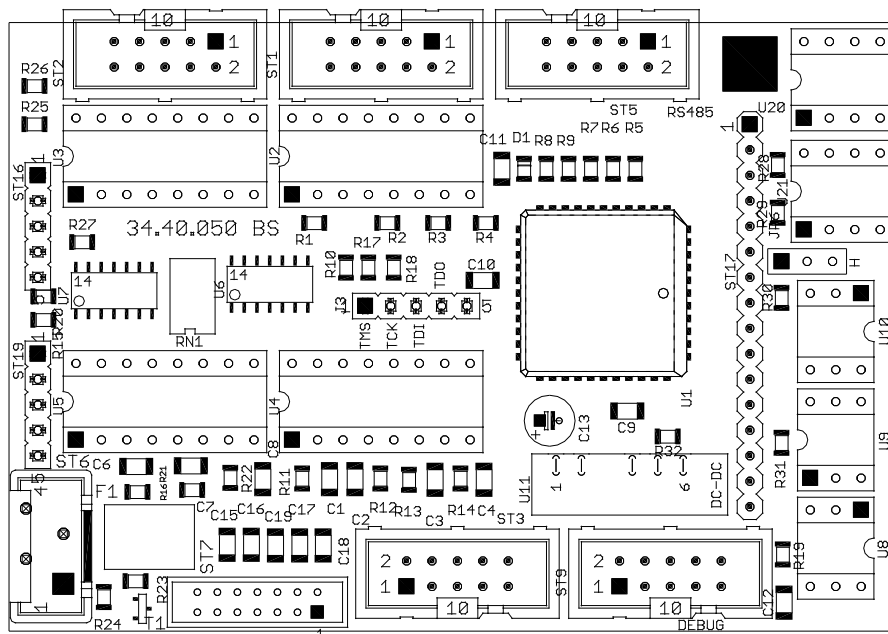
Figure 43

Jumper plan

ℹ **NOTICE!**

Only valid for complete equipped I/O board.

Function	Jumper position JP6
RS-422 full duplex	2-1
RS-485 full duplex	2-3

Component overview

U1	EPLD component
U2	Optocoupler outputs 1-4 (Output1)
U3	Optocoupler outputs 5-8 (Output2)
U4	Optocoupler inputs 1-4 (Input1)
U5	Optocoupler I/O 24V
U6	Driver inputs
U7	Driver RS-422 / RS-485
U8	Optocoupler DTR/DIR
U9	Optocoupler TXD1
U10	Optocoupler RXD1
U11	Voltage transformer 5V ±5V
U20, 21	Interface components RS-422 / RS-485

Plug-in positions

ST1	Outputs 1-4 (Output1)
ST2	Outputs 5-8 (Output2)
ST3	Inputs 1-4 (Input1)
ST5	RS-485 / RS-422
ST7	I/O 24V
ST8	24V / GND
ST16, 17, 19	Connection CPU

10.7 Ethernet (Option)
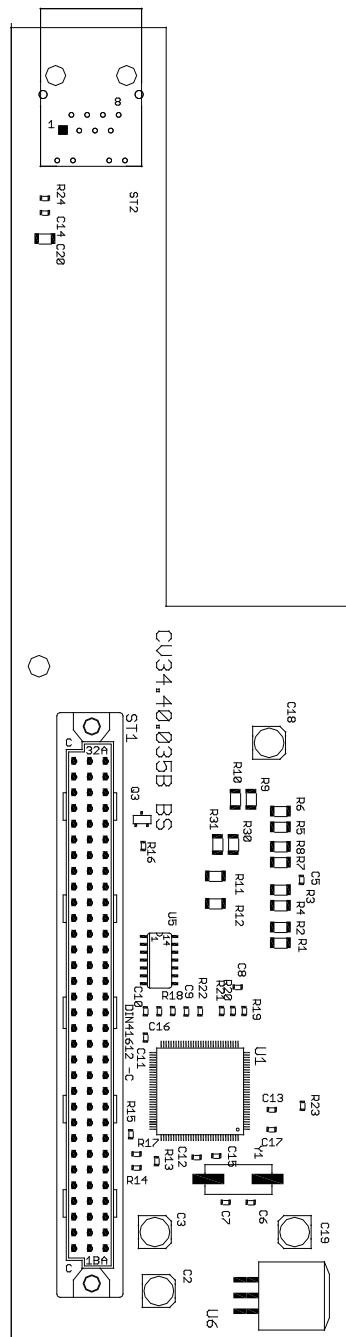
Figure 44

Component overview	U1	Ethernet processor
	U5	Reset inverter
	U6	Voltage control 3.3V

| **Plug-in positions** | ST1 | Connection bus male connector CPU |

11 Pin Assignment Interfaces

11.1 Centronics
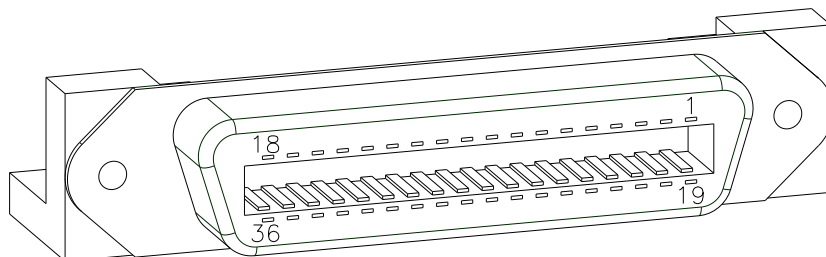
Figure 45

PIN	Signal
1	STROBE
2-9	DATA1-8
10	ACK
11	BUSY
12	PERROR
13	SELECT
14	AUTOFD
15-16	GND
18	VCC1284 (4,7V)
19-30	GND
31	INIT
32	FAULT
33-35	XXX
36	SELECTIN

11.2 RS-232
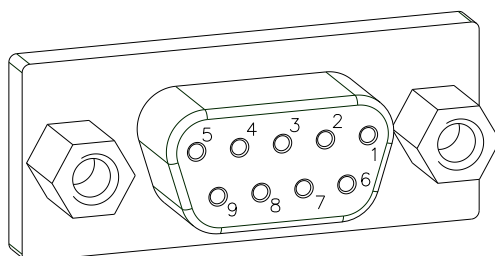
Figure 46

PIN	Signal
1	XXX
2	RXD
3	TXD
4-5	GND
6-9	XXX

11.3 RS-485 and RS-422 (Option)
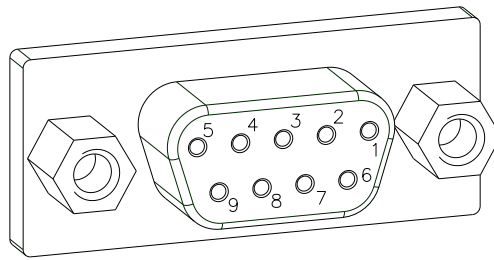
Figure 47

PIN at D-SUB female connector	Function RS-422 (full duplex)		Function RS-485 (half duplex)	
1	n/c		n/c	
2	n/c		n/c	
3	n/c		n/c	
4		TxD−	n/c	
5		TxD+	n/c	
6	n/c			TxD (RTxD)−
7	n/c			TxD (RxD)+
8		RxD−	n/c	
9		RxD+	n/c	

11.4 Ethernet (Option)
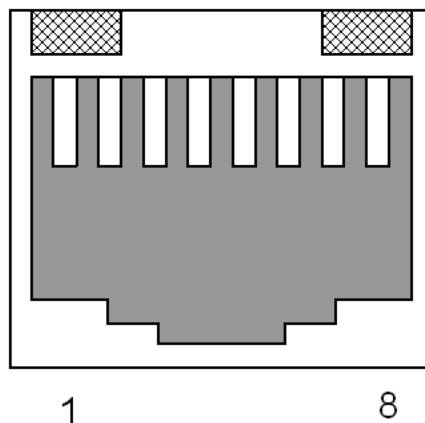
Figure 48

PIN RJ45 female connector	Description	
1		TX+
2		TX−
3		RX+
4	n/c	
5	n/c	
6		RX−
7	n/c	
8	n/c	

11.5 USB 1.0
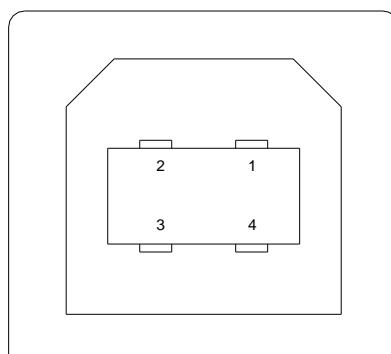
Figure 49

PIN	Signal
1	n/c
2	D−
3	D+
4	GND

12 Index

A

B

C

S

T

U

W