# Service Manual


# Print Module

# PX

Made in Germany

# Service Manual
## for the following products

| Family | Type |
|---|---|
| Print Module PX | PX4L |
| | PX4R |
| | PX4.3L |
| | PX4.3R |
| | PX6L |
| | PX6R |

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# Table of Contents




**1 Important Information ..... 4**
1.1 Instructions ..... 4
1.2 General Safety Instructions ..... 4
1.3 Protective Devices ..... 5
1.4 Handling Electricity ..... 5
1.5 Procedure in Case of Accidents ..... 5

**2 Preparation ..... 6**
2.1 Tools ..... 6
2.2 Removing and Installing the Backside Cover ..... 6

**3 Cleaning ..... 7**
3.1 Cleaning by the Operator ..... 7
3.2 Cleaning the Label Sensor ..... 7

**4 Replacing Assembly Units ..... 8**
4.1 Replacing the Printhead ..... 8
4.1.1 Replacing the Printhead PX4 ..... 8
4.1.2 Replacing the Printhead PX6 ..... 9
4.2 Replacing the Rollers and the Dispense Edge ..... 11
4.3 Replacing the Slipping Clutches ..... 12
4.4 Replacing Label Sensor ..... 14
4.5 Replacing the PCB CPU ..... 15
4.6 Replacing PCB Ribbon Saver and PCB Ribbon Saver Sensor ..... 16
4.7 Replacing PCB I/O Interface and PCB USB Hub ..... 17
4.8 Replacing the Power Supply Unit ..... 18

**5 Adjustments ..... 19**
5.1 Measuring and Adjusting the Winding Torques ..... 19
5.1.1 Measuring the Winding Torques ..... 19
5.1.2 Adjusting the Winding Torques ..... 21
5.2 Adjusting the Printing Mechanism ..... 22
5.2.1 Preparing the Printer for Adjustment ..... 22
5.2.2 Adjusting the Printhead Position ..... 23
5.2.3 Adjusting the Printhead Pressure ..... 24
5.2.4 Adjusting the Transfer Ribbon Feed Path ..... 25
5.2.5 Final Test ..... 25
5.3 Adjusting the Belt Tension at the Main Drive Motor ..... 26
5.4 Adjusting the Head Switch ..... 27
5.5 Adjusting the Magnetic Clutch ..... 28
5.6 Adjusting the Ribbon Saver Mechanics ..... 29
5.7 Configuring the Power Source for the OEM I/O Interface ..... 30

**6 Troubleshooting and Error Treatment ..... 31**
6.1 Failure of Device Functions ..... 31
6.2 Hardware Faults ..... 32

**7 Block Diagram ..... 33**

**8 Layout Diagram PCB CPU ..... 35**

**9 Index ..... 37**

# 1 Important Information



## 1.1 Instructions

Important information and instructions in this documentation are designated as follows:

**Danger!**
**Draws your attention to an exceptionally grave, impending danger to your health or life.**

**Warning!**
**Indicates a hazardous situation that could lead to injuries or material damage.**

**Attention!**
**Draws attention to possible dangers, material damage or loss of quality.**

**Notice!**
**Gives you tips. They make a working sequence easier or draw attention to important working processes.**

Environment!
Gives you tips on protecting the environment.

▶ Handling instruction

▷ Reference to section, position, illustration number or document.

∗ Option (accessories, peripheral equipment, special fittings).

`Time` Information in the display.

## 1.2 General Safety Instructions

This service manual is intended for use by qualified service and maintenance personnel. For more operation and configuration information, refer to the user or configuration manual.

**Follow the general safety rules below:**

- Keep the area around the device clean at all times!
- Work with safety in mind.
- Parts of device that are removed during the maintenance work must be put in a safe place.
- Avoid risks of tripping over.

**Danger!**
**Danger to life and limb from increased current flow through metal parts in contact with the device.**
**▶ Do not wear clothing with metal parts.**
**▶ Do not wear jewelry.**

**Warning!**
**Items of clothing drawn into the device by moving parts can lead to injuries.**
**▶ Do not wear any items of clothing which could get caught by moving parts.**

## 1.3 Protective Devices

**Warning!**

**There is a risk of injury if protective devices are missing or defective.**

- ▶ **Replace all protective devices (covers, safety notices, grounding cables etc) after maintenance work has been completed.**
- ▶ **Replace parts that have become defective or unusable.**

**Wear protective goggles for:**

- Knocking pins or similar parts in or out with a hammer.
- Using spring hooks.
- Inserting or removing springs, retaining rings or grip rings.
- Using solvents, cleansers or other chemicals.

## 1.4 Handling Electricity

**The following work may only be done by trained and qualified electricians:**

- Work on electrical components.
- Work on an open device still connected to the mains supply.

**General precautions before starting maintenance work:**

- Find out where the emergency and power switches are so that they can be quickly thrown in an emergency.
- Disconnect the current supply before carrying out the following work:
  - Installing or removing power units.
  - Working in the immediate vicinity of open power supply components.
  - Mechanical check of power supply components.
  - Modifying circuits in the device.
- Test the zero potential of the device parts.
- Check the working area for possible sources of danger, such as wet floors, defective extension cables, defective protective conductor connections.

**Additional precautions in the case of exposed voltages:**

- Ask a second person to remain near the working site. This person must know where the emergency and power switches are, and how to switch the current off if danger arises.

## 1.5 Procedure in Case of Accidents

- Act calmly and with great care.
- Avoid danger to yourself.
- Switch off power.
- Request medical assistance.
- Give first aid, if necessary.

## 2.1 Tools

▶ Do not use any worn of damaged tools.

▶ Only use tools and testing devices that are suitable for the task at hand.

**cab special tools:**

- Test collar for transfer ribbon winder (cab item number: 5534199)
- Distance caliber 0,1 mm (cab item number: 5961064)

**Standard tools:**

- Torx screwdriver TX 20
- Hexagon electronic screwdriver 1,5 mm
- Hexagon key 2,5 mm (on print module)
- Phillips-head screwdriver, size 1
- Precision circlip pliers A0
- Precision circlip pliers A1
- Hexagon socket spanner 5
- Hexagon socket spanner 5,5
- Cylindrical dynamometer (spring scale), 0 - 10 N
- Digital multimeter

## 2.2 Removing and Installing the Backside Cover

**Attention!**

**The backside cover or cables can be damaged via careless handling.**

**▶ Move cable out of the risk area.**

**▶ Put cover into the guiding complete.**

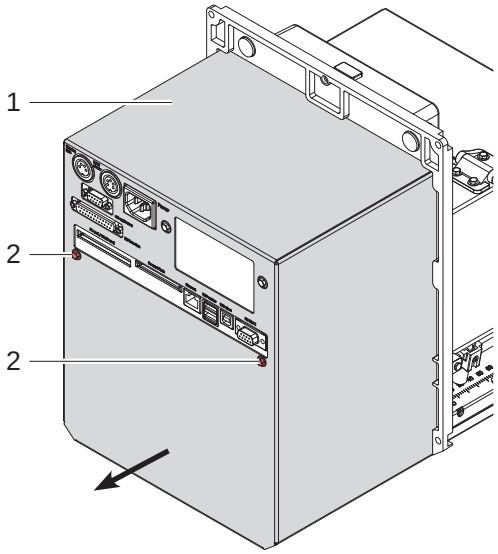



Fig. 1 Removing and Installing the Backside Cover

**Dismount cover :**

1. Loosen screws (2).
2. Move cover (1) in arrow direction.

**Mount cover :**

1. Move cover (1) against arrow direction on the device.
2. Make sure that all cables are out of the risk area at the edges of cover.
3. Move the cover (1) complete in the circumferential guiding.
4. Fix cover (1) with screws (2) and tighten the screws.

# 3 Cleaning

## 3.1 Cleaning by the Operator

The following cleaning work is described in the “Operator's Manual“:

- cleaning the device
- cleaning the printhead
- cleaning the print roller

## 3.2 Cleaning the Label Sensor

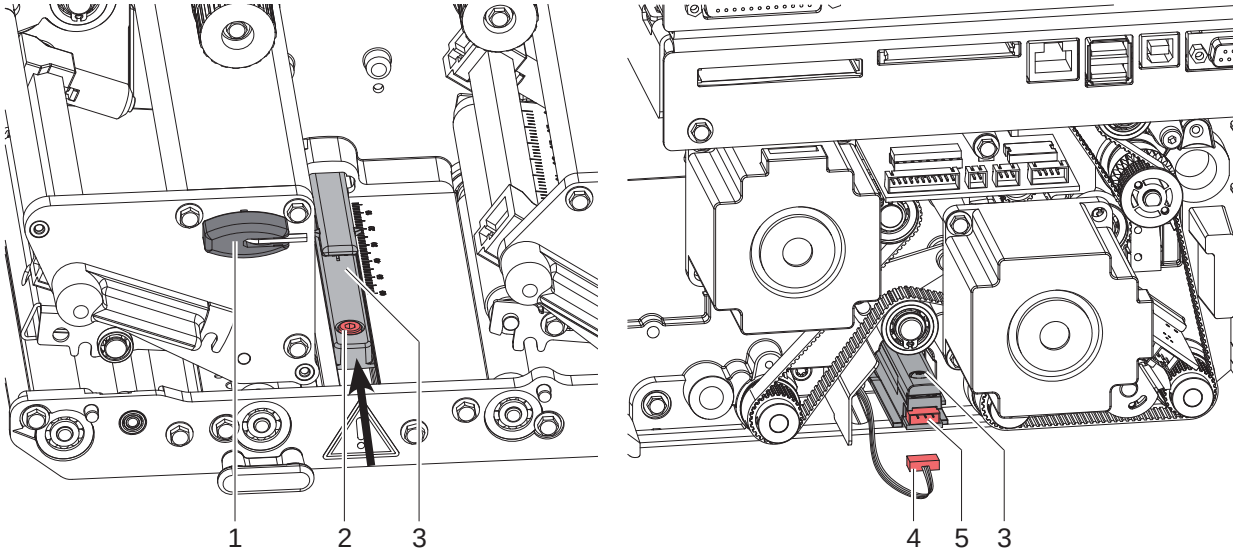



Fig. 2 Cleaning the label sensor

**Danger!**

**Risk of death via electric shock!**

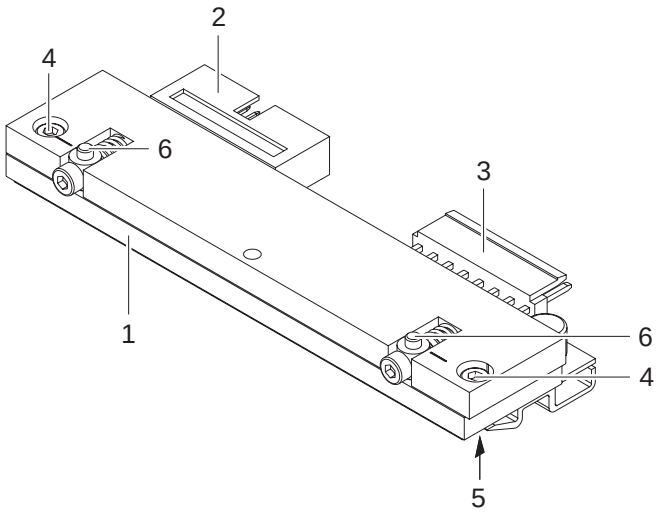
▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

1. Unplug the printer from the electrical outlet and remove the cover of the printer ▷ 2.2 Cover dismount / mount.
2. Remove the material from the printer.
3. Disconnect the cable (4) and connector (5) from the label sensor (3) .
4. Loosen screw (2) with the Allen key (1).
5. Push the label sensor (3) in arrow direction and pull it out.
6. Clean label sensor and sensor units (3) with brush or cotton swab soaked in pure alcohol.
7. Move label sensor (3) against the arrow direction in the former position.
8. Connect cable (4) with connector (5) .
9. Mount cover and restore all connections.
10. Adjust label sensor ▷ Operator's Manual.
11. Tighten screw (2) .

## 4.1 Replacing the Printhead

### 4.1.1 Replacing the Printhead PX4

The printhead can be replaced without the need for fine adjustment. The printhead must be replaced if worn or when switching to a printhead with higher or lower resolution. For better differentiation, the printheads have a label stating the resolution.




1 Printhead
2 Plug connection
3 Plug connection
4 Screw
5 Printing line
6 Pin

Fig. 3 Structure of the printhead PX4

**Attention!**
**The printhead is mounted as assembly and precisely aligned at the factory.**
- **Do not loosen the screws (4) under any circumstances.**

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

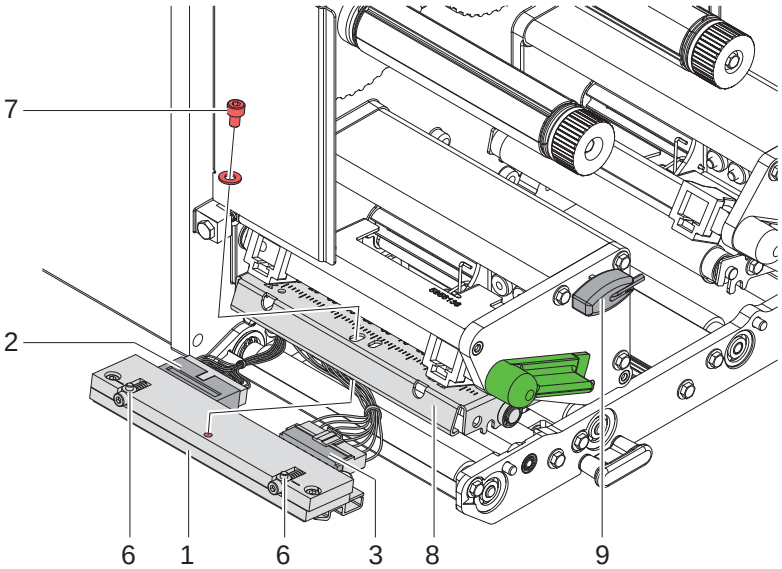



Fig. 4 Replacing printhead PX4

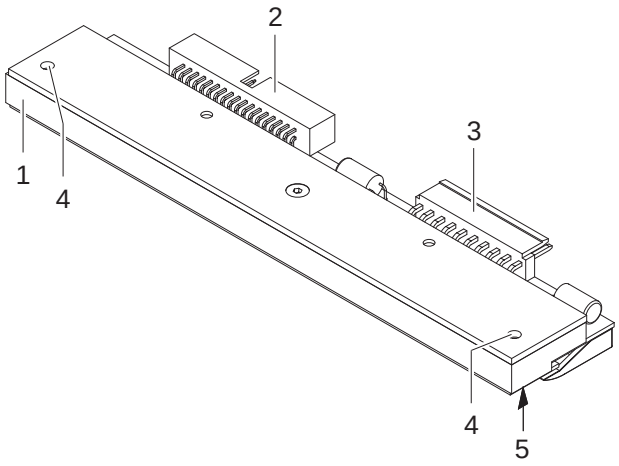
**Removing the printhead**

1. Lift the printhead.
2. Remove labels and transfer ribbon from the printer.
3. Lightly keep printhead mounting bracket (8) on the print roller, screw out screw (7) with the Allen key (9) and remove screw and washer.
4. Swivel printhead mounting bracket (8) upward.
5. Remove printhead (1) from the printhead mounting bracket (8) if necessary.
6. Loosen both plug connections (2, 3).

**Installing the printhead**

1. Attach plug connections (2, 3).
2. Position printhead (1) in printhead mounting bracket (8) in such a way that the pins (6) are secured in the corresponding holes in the printhead mounting bracket (8).
3. Lightly keep printhead mounting bracket (8) on the print roller and check for correct positioning of the printhead in the mounting bracket (8).
4. Insert screw (7) with washer and tighten it with the Allen key (9).
5. Reload labels and transfer ribbon.

## 4.1.2 Replacing the Printhead PX6




1 Printhead
2 Plug connection
3 Plug connection
4 Threaded hole
5 Printing line

Fig. 5 Structure of the printhead PX6

**Attention!**

**The printhead can be damaged by static electricity discharges and impacts!**

- ▶ **Ground your body, e.g. by wearing a grounded wristband.**
- ▶ **Do not touch contacts on the plug connections (2, 3).**
- ▶ **Do not touch printing line (5) with hard objects or your hands.**

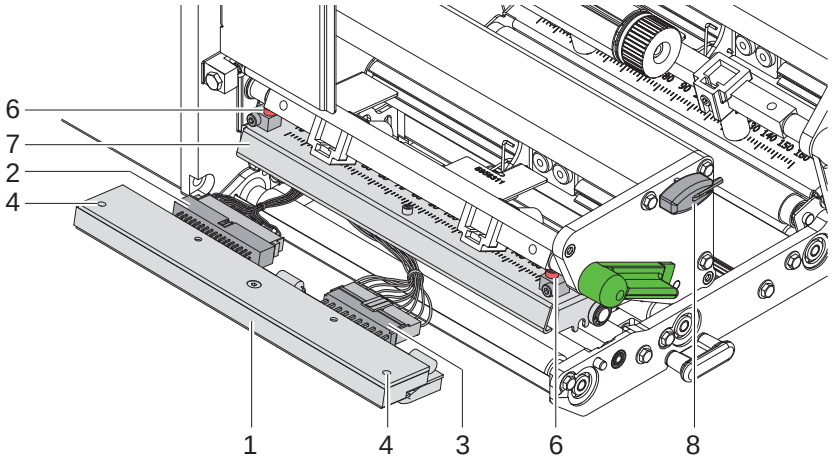



Fig. 6 Replacing the printhead PX6

**Removing the printhead**

1. Lift the printhead.
2. Remove labels and transfer ribbon from the printer.
3. Lightly keep printhead mounting bracket (7) on the print roller and loosen screws (6) with the Allen key (8).
4. Swivel printhead mounting bracket (7) upward.
5. Remove printhead from the printhead mounting bracket (7) if necessary.
6. Loosen both plug connections (2, 3) on the printhead.

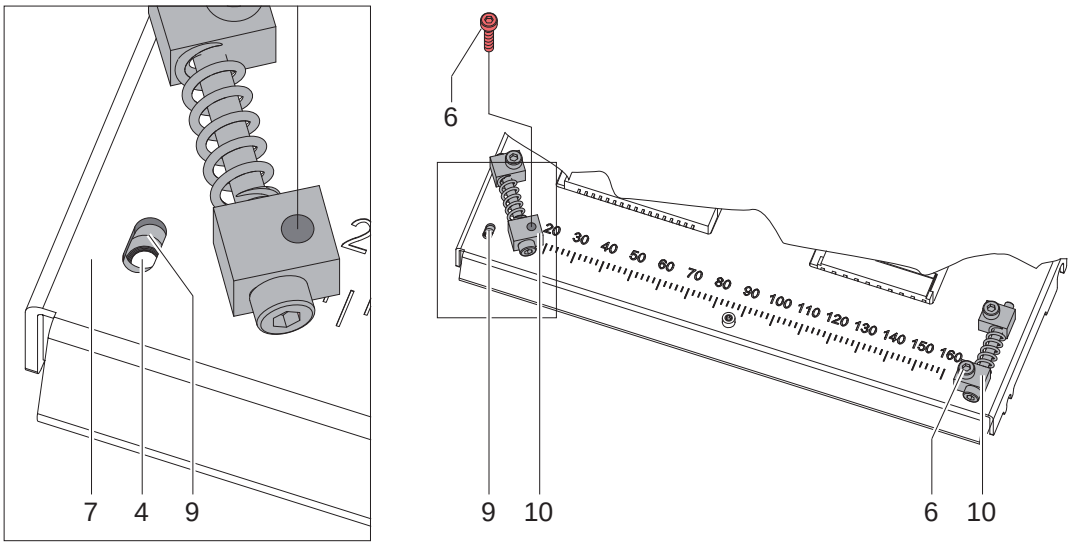



Fig. 7 Installing the printhead PX6

**Installing the printhead**

1. Attach plug connections (2, 3).
2. Swing the adjustment elements (10) sidewards to uncover the slots (9) in the printhead carriage.
3. Put in the printhead into the printhead carriage and swing down the printhead assembly by hand and hold it.
4. Position the printhead in such a way that the threaded holes (4) of the printhead are centered into the slots (9) of the printhead carriage (7).
5. Swing back the adjustment elements (10) to the home position.
6. Insert and tighten the screws (6).
7. Reload labels and transfer ribbon.

## 4.2 Replacing the Rollers and the Dispense Edge

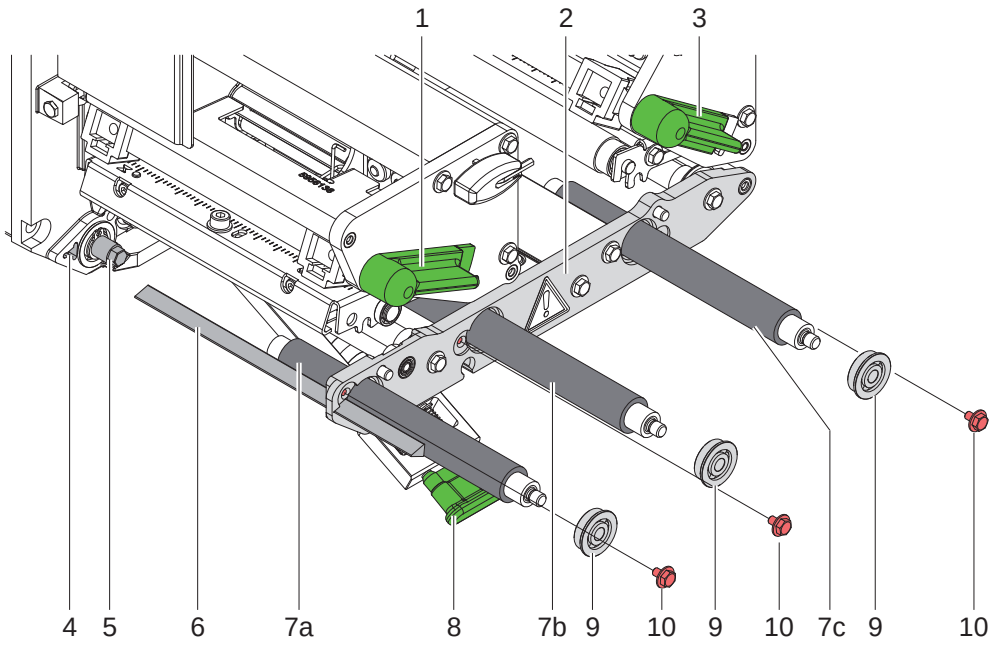


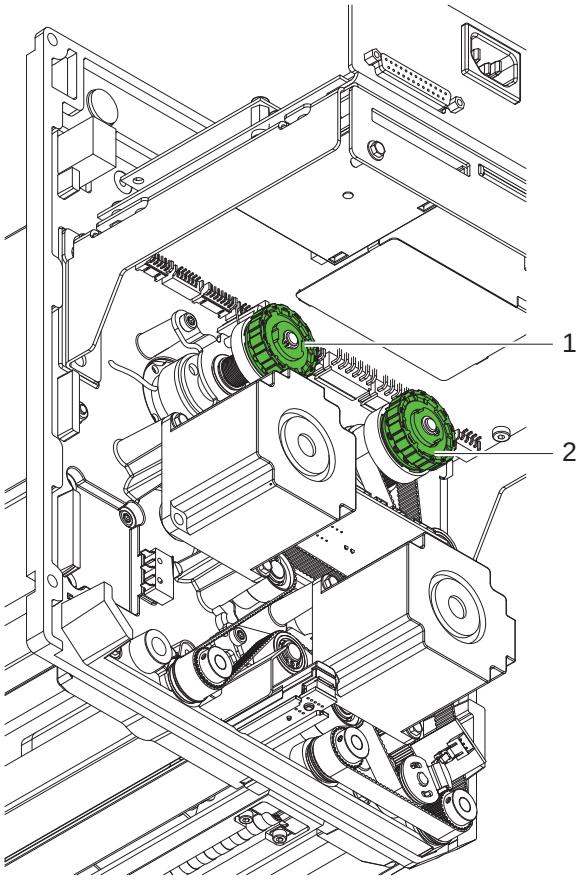

Fig. 8 Replacing the rollers and the dispense edge

1. Unlock levers (1,3) to lift the printhead and the pinch roller. Open the locking system (8) and swing it down.
2. Loosen screws (10) and remove ball bearings (9) from the bearing plate (2).
3. Pull out the rollers (7) and/or the dispense edge (6).
4. Insert new rollers (7) and push them onto the hexagonal ends of the concerning axles (5) while turning slightly.
5. Insert the dispense edge (6) through the bearing plate (2) into the notch (4).
6. Insert ball bearings (9) into the bearing plate (2) and secure them with the screws (10).

## 4.3 Replacing the Slipping Clutches

The rewinder for the transfer ribbon is coupled to the main drive using a slipping clutch in. The supply hub of the transfer ribbon is braked with a slipping clutch during printing.

Replace a slipping clutch when it can no longer be set ▷ 5.1 on page 19. Removal and installation of the slipping clutch is also required for replacement of a winder.




1 Transfer ribbon supply hub: brake
2 Transfer ribbon take up hub: coupling

Fig. 9 Slipping clutches

**Danger!**

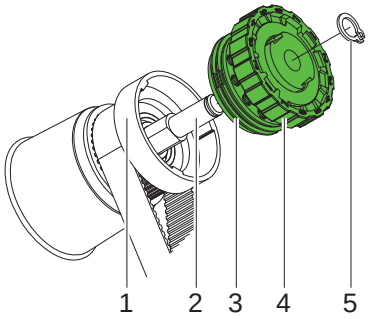
**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

#### Removing the slipping clutch

1. Unplug the printer from the electrical outlet.
2. Remove the rear cover of the printer ▷ 2.2 Cover dismount / mount.
3. Remove the snap ring (Fig. 10/5) / (Fig. 11/7) .
4. Pull coupling (2) or brake (1) from the winder axis (Fig. 10/2) / (Fig. 11/2).
5. Ensure that the pin (Fig. 11/5) remains on the winder axis when pulling the brake off. Reattach the pin to the winder axis if it has been pulled off. The axis profile is shaped in such a way that the pin only fits on the winder axis in one way.

### Installing the slipping clutch on the ribbon take up hub

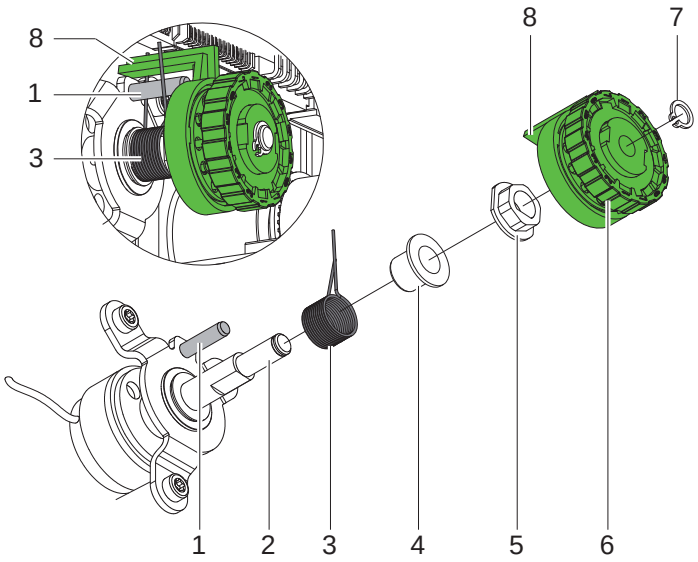



1 Collar of the belt wheel
2 Winder axis
3 Coupling disks
4 Slipping clutch
5 Snap ring

Fig. 10 Slipping clutch on the ribbon rewinder

1. Slide coupling (4) onto the winder axis (2).
2. Align grooves in the coupling disks (3) with the guides in the collar of the belt wheel (1).
3. Slide coupling further until it stops.
4. Secure the snap ring (5).
5. Adjust the coupling ▷ 5.1 on page 19.

### Installing the brake on the ribbon supply hub




1 Bolt
2 Winder axis
3 Spring
4 Bush bearing
5 Pin
6 Brake
7 Snap ring
8 Lever

Fig. 11 Brake on ribbon supply hub

1. Check the placing of spring (3), bush bearing (4) and pin (5) on the winder axis (2) and correct it if necessary.
2. Slide the brake (6) onto the winder axis (2) in such a way that it fits on the hexagonal profile of the pin (5).
3. Ensure that the lever (8) grasps between the two ends of the spring (3).
4. Secure the snap ring (7).
5. Adjust the coupling ▷ 5.1 on page 19.

## 4.4 Replacing Label Sensor

**Notice!**
**Soiling of the label sensor can also cause malfunctions.**

▶ **Before replacing the label sensor, check whether it is soiled and clean it if necessary.**
**▷ 3.2 on page 7 Cleaning the label sensor.**

**Danger!**
**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

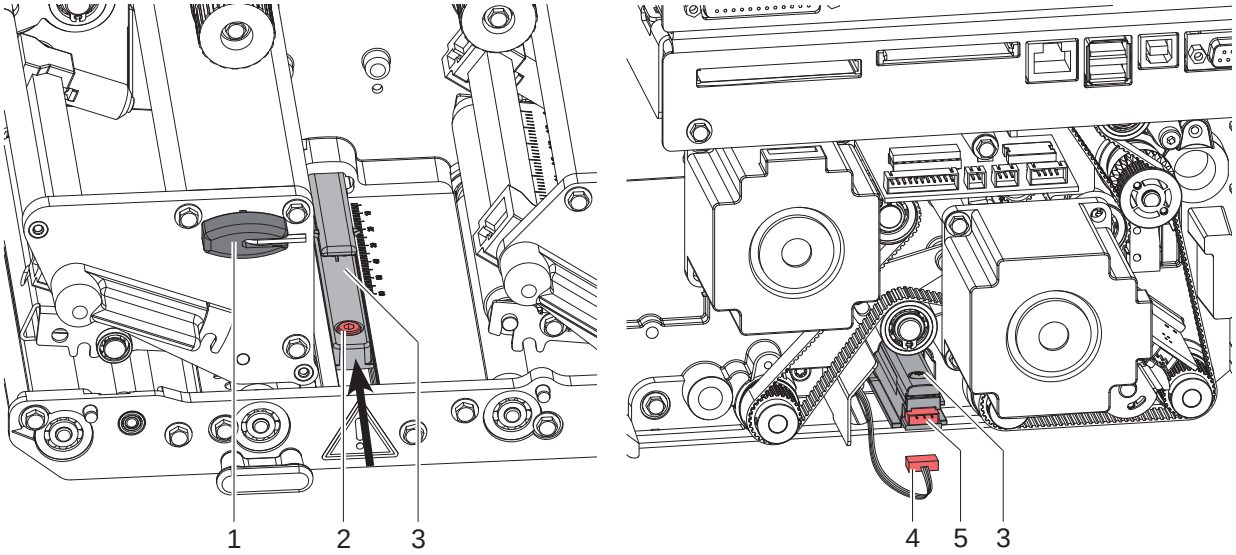



Fig. 12 Replacing the label sensor

**Removing the label sensor**

1. Unplug the printer from the electrical outlet and remove the cover of the printer ▷ 2.2 Cover dismount / mount.
2. Remove the material from the printer.
3. Disconnect the cable (4) from the connector (5) of the label sensor (3) .
4. Loosen screw (2) with the Allen key (1).
5. Push the label sensor (3) in arrow direction and pull it out.

**Installing the label sensor**

1. Move new label sensor (3) against the arrow direction in the former position.
2. Connect cable (4) with connector (5) .
3. Mount cover and restore all connections.
4. Adjust label sensor ▷ Operator's Manual.
5. Align the label sensor ▷ Configuration Manual.
6. Tighten screw (2) .

## 4.5 Replacing the PCB CPU

**Danger!**
**Risk of death via electric shock!**
▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

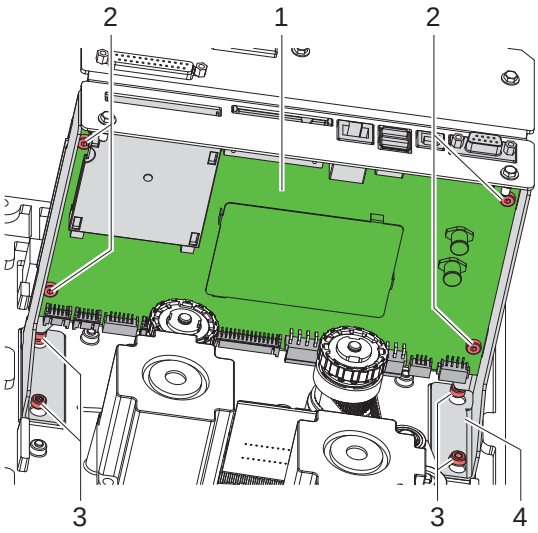



Fig. 13 Replacing the PCB CPU

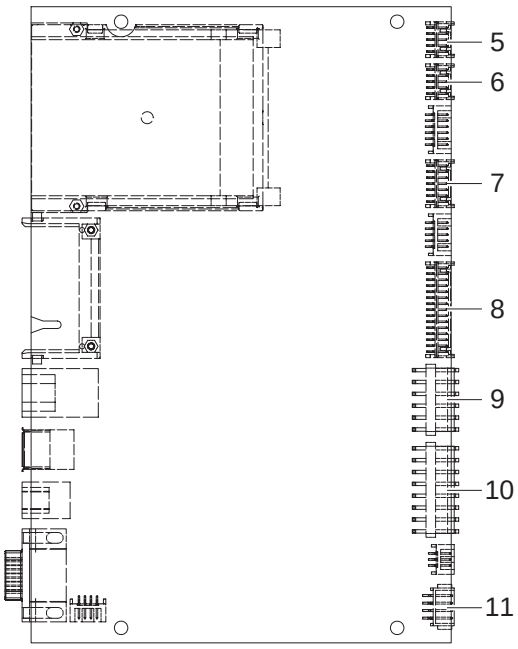



Fig. 14 Connectors on the PCB CPU
▷ Block diagram

**Removing the PCB CPU**

1. If possible, save the printer configuration to a Compact Flash card ▷ Configuration Manual.
2. Unplug the printer from the electrical outlet.
3. Detach all interface cables from the back of the printer.
4. Remove all memory cards from the slots.
5. Dismount cover ▷ 2.2 Cover dismount / mount
6. Loosen screws (3) and take out PCB CPU with retainer (4).
7. Unplug all plug connections from the PCB CPU (1).
8. Loosen the four screws (2) on the PCB CPU (1).
9. Remove PCB CPU (1) .

**Installing the PCB CPU**

1. Fix PCB CPU (1) on the retainer with four screws (2) .
2. Insert all plug connections on the PCB CPU (1).
3. Hook in retainer with PCB CPU (1) and tighten screws (3).
4. Mount cover.
5. Restore all interface connections on the back of the printer.
6. Connect the power cable at the rear of the printer.
7. Update the firmware if necessary.
8. Adjust the label sensor ▷ Configuration Manual.
9. Load the printer configuration from the memory card if possible.
   Otherwise, set the printer configuration via the control panel ▷ Configuration Manual.

5 PCB USB Hub
6 PCB Ribbon saver
7 Sensors
8 Printhead signals
9 Printhead power supply
10 Power supply unit
11 Stepper motor

## 4.6 Replacing PCB Ribbon Saver and PCB Ribbon Saver Sensor

**Danger!**

**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

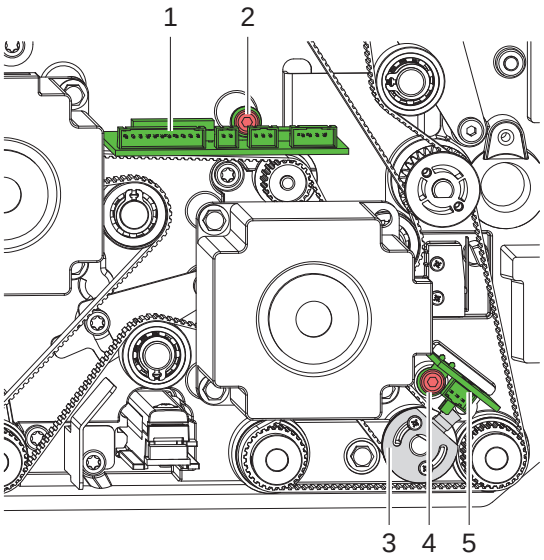
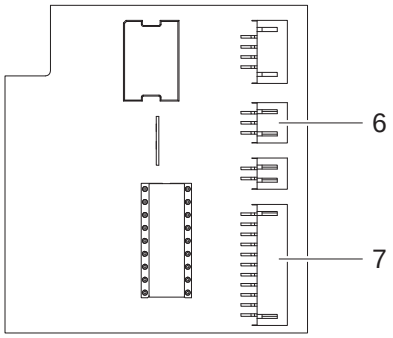



Fig. 15 Replacing PCB Ribbon Saver and PCB Ribbon Saver Sensor

1. Unplug the printer from the electrical outlet.
2. Remove the cover of the printer ▷ 2.2 Cover dismount / mount.
3. Unplug all plug connections from the PCB Ribbon saver (1) or PCB Ribbon saver sensor (5).
4. Loosen screw (2) to remove PCB Ribbon saver (1) or screw (4) to remove PCB Ribbon saver sensor (5).
5. Remove the PCBs.
6. Mounting in reverse order.




6 PCB Ribbon Saver sensor
7 PCB CPU

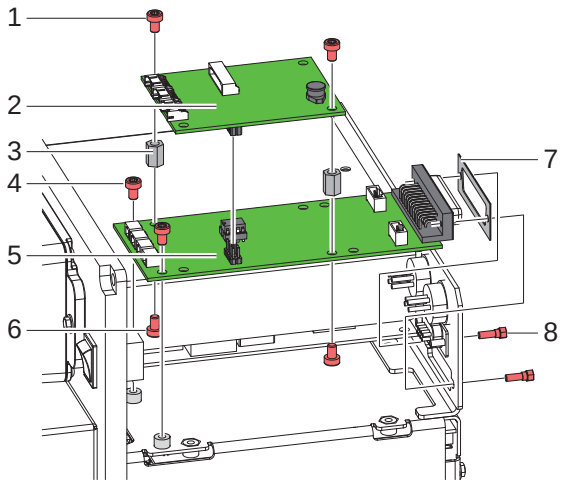
Fig. 16 Connectors PCB Ribbon Saver ▷ Block diagram

## 4.7 Replacing PCB I/O Interface and PCB USB Hub

**Danger!**

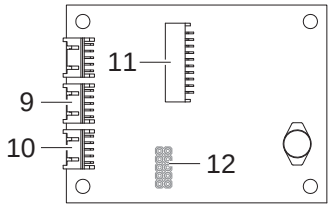
**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**



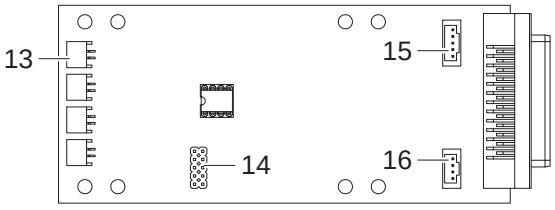

1. Unplug the printer from the electrical outlet.
2. Remove the cover of the printer ▷ 2.2 Cover dismount / mount.
3. Detach all cables from the PCB I/O Interface (5) and the PCB USB Hub (2).
4. Loosen screws (1) detach the PCB USB Hub (2) from the PCB I/O Interface (5).
5. To replace the PCB I/O Interface (5) loosen screws (4) and bolts (8). When replacing the PCB cab I/O interface save the plate (7).
6. Remove distance bolts (3) by loosening the screws (1)
7. Mounting in reverse order..

Fig. 17 Replacing PCB I/O Interface and PCB USB Hub



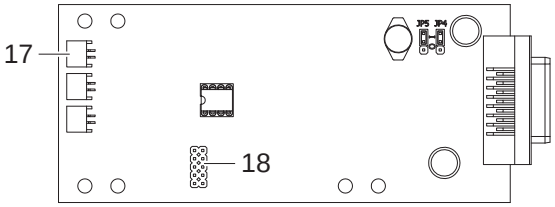

**PCB USB Hub**

9 Connector cab Applicators
10 Control Panel
11 PCB CPU
12 PCB I/O Interface




**PCB cab I/O Interface**

13 Sensor Backfeed Roller
14 PCB USB Hub
15 Connector Warning Sensor Label End
16 Connector Warning Light




**PCB OEM I/O Interface**

17 Sensor Backfeed Roller
18 PCB USB Hub

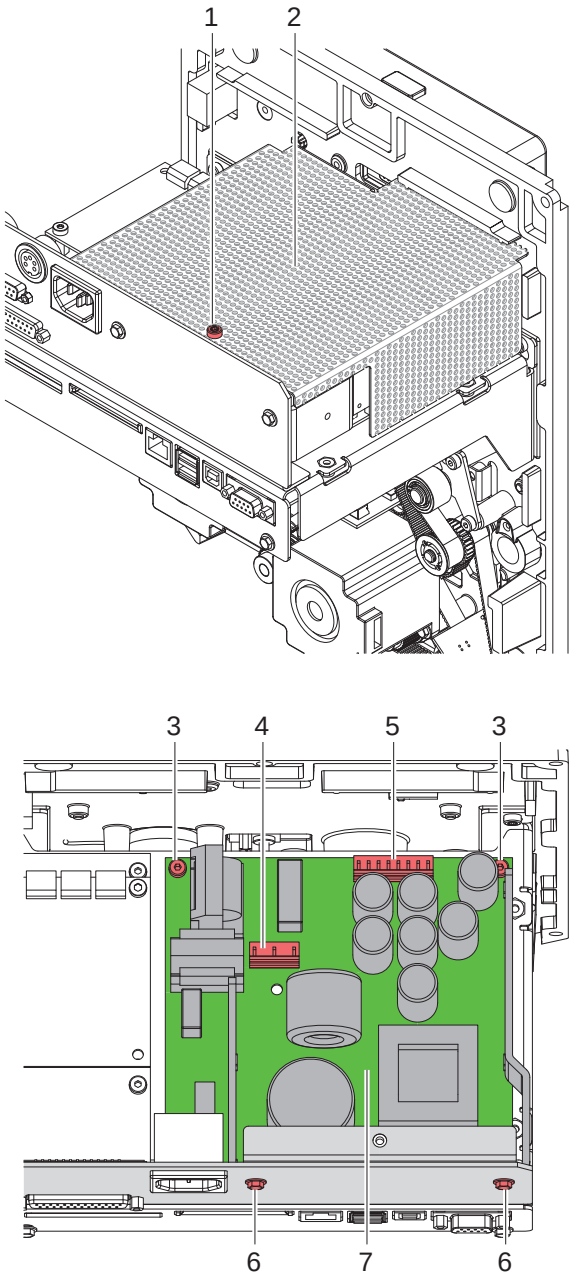
Fig. 18 Connectors on PCB I/O Interface and PCB USB Hub ▷ Block diagram

## 4.8 Replacing the Power Supply Unit

**Danger!**

**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**




**Removing the power supply unit**

1. Unplug the printer from the electrical outlet.
2. Remove the cover of the printer ▷ 2.2 Cover dismount / mount..
3. Loosen screw (1) and remove cover plate (2).
4. Detach connector on the power supply input (4).
5. Detach connector on the power supply output (5).
6. Loosen screws (3,6).
7. Remove power supply (7).

**Installing the power supply unit**

1. Fix power supply (7) with the screws (3,6).
2. Connect cable to the PCB CPU with power supply output (5)
3. Connect input cable with power supply input (4)
4. Mount cover plate (2) and fix it with screw (1).
5. Mount cover.

Fig. 19 Replacing the power supply unit

## 5.1 Measuring and Adjusting the Winding Torques

The rewinder for the transfer ribbon is coupled to the main drive using a slipping clutch in. The supply hub of the transfer ribbon is braked with a slipping clutch during printing.

The correct setting of the torques of these slipping clutches is necessary for:

- precise conveyance of the transfer ribbon during label transport
- the prevention of wrinkles in the feed path of the transfer ribbon

The winding axes of the rewinder are not actively driven by the belts during label reverse, but rather solely by the pull of the print roller. The torque required to disengage the rewinder from the belt drive is implemented via a brake in the winding reel, which works in both directions. The measured torque against the winding direction is the sum of the coupling torque and the torque of the brake. Only the torque of the brake is measured when the winding axis is rotating in winding direction. For this reason, measurement of the torques at the rewinders are required in both directions.

Measurement of the winding torques at the transfer ribbon take up and supply hub ▷ 5.1.1 on page 19.

If the winding torque differs from the set value, it must be adjusted. ▷ 5.1.2 on page 21.

### 5.1.1 Measuring the Winding Torques

Measurement of the winding torque at the transfer ribbon take up and supply hub occurs by determining the pulling forces on a test collar attached to the winder.

The physical relation between the torque and the pulling force is:

$$F = M / r$$

F: Pulling force [N],

M: Winding torque [Ncm],

r: Radius of the test collar (30 mm)

The set values for the winding torque and the resulting pulling force at the test collar are:

| Slipping clutch on | Direction of rotation | Winding torque M | Pulling force F |
|---|---|---|---|
| Ribbon take up hub | against winding direction | 12,9 - 13,5 Ncm | 4,3 - 4,8 N |
| | in winding direction | 2,1 - 3,0 Ncm | 0,7 - 1,0 N |
| Ribbon supply hub | any | 3,6 - 4,5 Ncm | 1,2 - 1,5 N |

Table 1 Winding torques at the transfer ribbon hubs

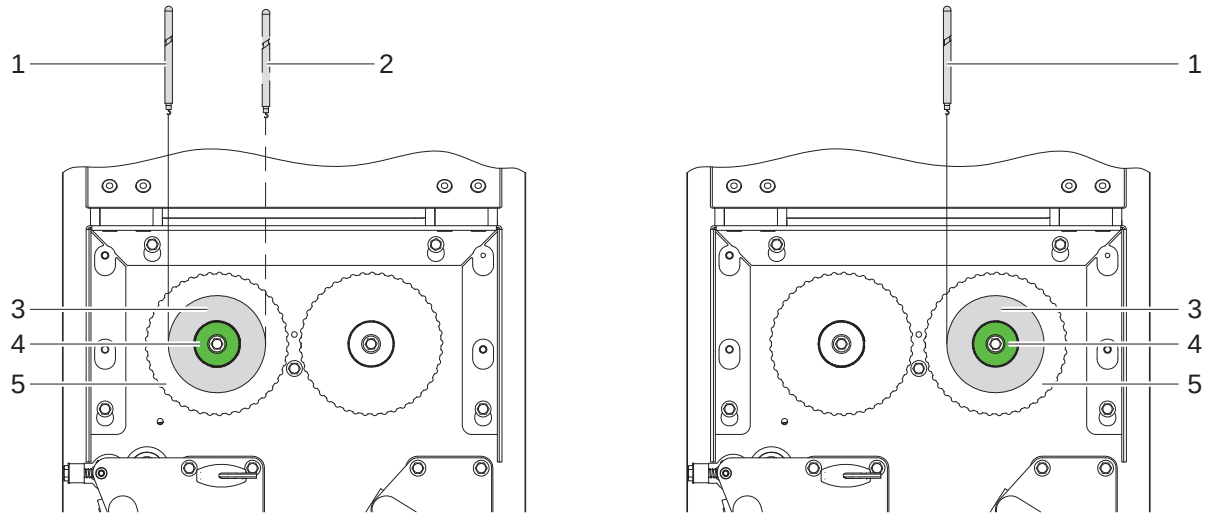



Fig. 20 Measuring the winding torque at the transfer ribbon take up hub (left) and supply hub (right)

**Danger!**

**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

1. Unplug the printer from the electrical outlet.
2. Remove cover ▷ 2.2 on page 6.
3. Remove the transfer ribbon from the printer.
4. Attach the test collar (3) to the winder.
5. Turn the knurled nut (4) counterclockwise to clamp the test collar.
6. Wind the cord attached to the test collar around the test collar several times.
7. Secure spring scale [10 N] (1) at the end of the cord.
8. Move the spring scale upward vertically until the winder begins turning.
9. If the drive belt at the rewinder is also moving, hold it in place during the measurement. Otherwise, the measurement is not accurate.
10. Allow the cord to unwind from the test collar at least one full turn and read the pulling force F on the spring scale at the same time.
11. Determine the pulling force at the transfer ribbon take up hub in the same manner, except in the opposite rotation direction (2).
12. If the winding torque differs from the set value, it must be adjusted ▷ 5.1.2 on page 21.

### 5.1.2 Adjusting the Winding Torques

The winding torque of a winder can be changed at the knurled ring of the respective slipping clutch. The numbers on the knurled ring stand for the value of the winding torque:

- 1: Lowest winding torque
- 7: Highest winding torque

The current value is indicated by the number located at the positions of the two locking tabs.

**Danger!**

**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

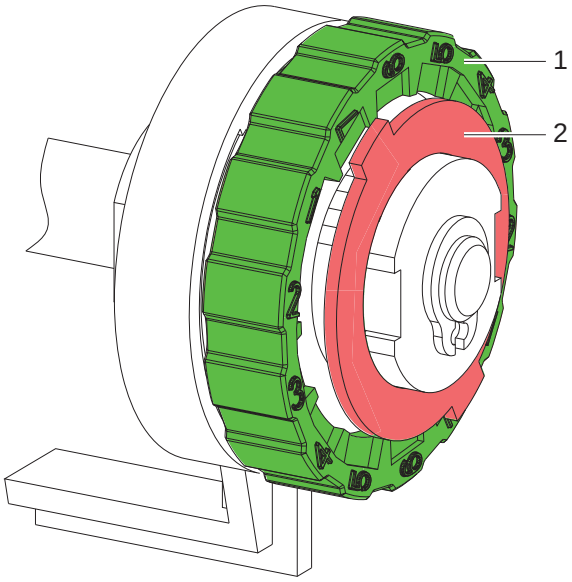



Fig. 21 Adjusting the winding torque

1. Unplug the printer from the electrical outlet.
2. Remove the cover. ▷ 2.2 Cover dismount / mount.
3. Press the knurled ring (1) of the slipping clutch toward the housing wall.
   The lock (2) of the knurled ring is released.
4. Turn the knurled ring while pushing it and release it in the desired position.
5. Ensure that the tabs of the lock are located completely in the grooves of the setting value.
6. Measure the winding torque again and compare it to the set value ▷ 5.1.1 on page 19.
7. Repeat the adjustment until the measured winding torque is within the tolerance range.
   Is it not possible change the slipping clutch ▷ 4.3 on page 12.
8. Mount cover.

## 5.2 Adjusting the Printing 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.**

▶ **Check the transfer ribbon feed path and the head locking system for correct adjustment before making adjustments to the printing mechanism ▷ Operator's Manual.**

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

1. Prepare the label printer for adjustment ▷ 5.2.1 on page 22.
2. Adjust the position of the printhead ▷ 5.2.2 on page 23.
3. Adjust the printhead pressure ▷ 5.2.3 on page 24.
4. Adjust the transfer ribbon feed path ▷ 5.2.4 on page 25.
5. Perform a final test ▷ 5.2.5 on page 25.

### 5.2.1 Preparing the Printer for Adjustment

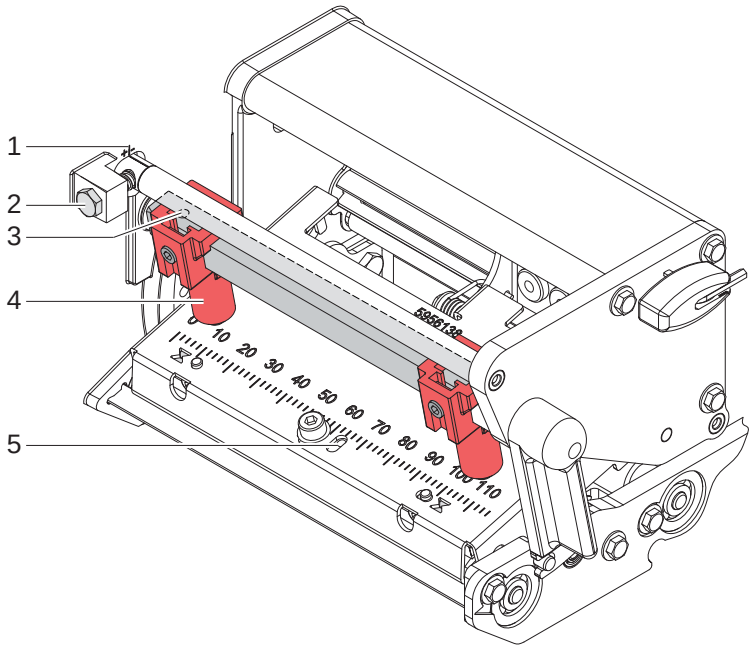



Fig. 22 Preparing the printer for adjustment

1. Load labels and transfer ribbon which extend across the entire printing width
2. In the printer configuration, set the `Heat level` parameter to -5 and the `Print speed` parameter to 100 mm/s.
3. Move the transfer ribbon deflection to the central position (1) with the screw (2).
4. Position the plungers (4) in such a way that the adjustment screws are accessible through the holes (3) of the square axis.
5. Loosen the screw (5) for the printhead bowing with an Allen key (1.5 mm) and turn it counterclockwise until turning becomes perceptibly easier. This should occur after a maximum of a half a rotation.
6. Continue with the adjustment of the printhead position ▷ 5.2.2 on page 23.

## 5.2.2 Adjusting the Printhead Position

In order to achieve the best possible print image the following printhead settings are necessary:

- 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.

**Attention!**

**The printhead assembly can be damaged.**

**Attempting to adjust the printhead when the fixing screws (3) are tight can lead to defects at the printhead assembly.**

**▶ Always loosen the fixing screws (3) before adjusting the printhead.**

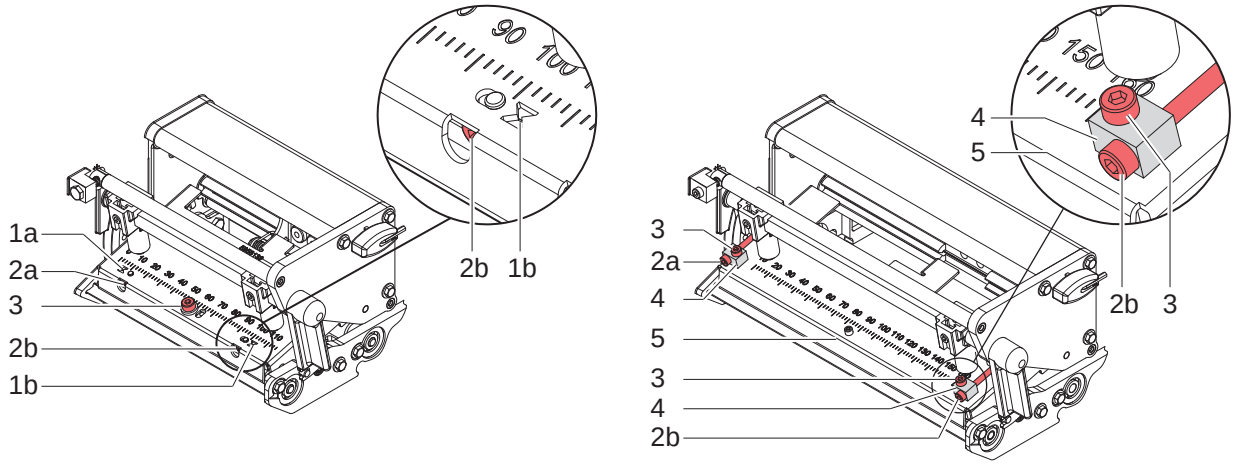



Fig. 23 Adjusting the printhead position (left PX4 / right PX6)

**Notice!**

**▶ Open and close the printhead lock after each step of the adjustment.**

1. Check the alignment of the printhead on a output of a test print - parallelism printed lines to the label corner.
2. If the printhead is not aligned properly, loosen the screw (3) about one quarter turn.
3. If the printhead is not aligned properly, use the screws (2) to align at PX4 the lines on the printhead with the tips of the grooves (1) respectively at PX6 front edge of the printhead mounting bracket with the front edge of the slides.
   - Screw (2a) effects the inner half of the printhead, and screw (2b) the outer half.
   - Turning clockwise moves the printhead at PX4 forward, at PX6 backward.
4. Create print samples with the test function `Test grid` (▷ Configuration Manual) or a similar print pattern.
5. If the horizontal lines in the test grid are not parallel with the label edges, adjust the parallelism with the screws (2).
6. Set the best possible image quality by maintaining parallelism via turning the screws (2a) and (2b) in an alternating fashion.
   Differences in the density between the two sides are still permissible.
7. Tighten the screws (3).
8. When the parallelism of the printhead is set, continue with the adjustment of the printhead pressure ▷ 5.2.3 on page 24.

### 5.2.3 Adjusting the Printhead Pressure

The printhead pressure can be changed with the screws (1a) and (1b) at the inside and outside of the printhead. 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 to the opposite side.

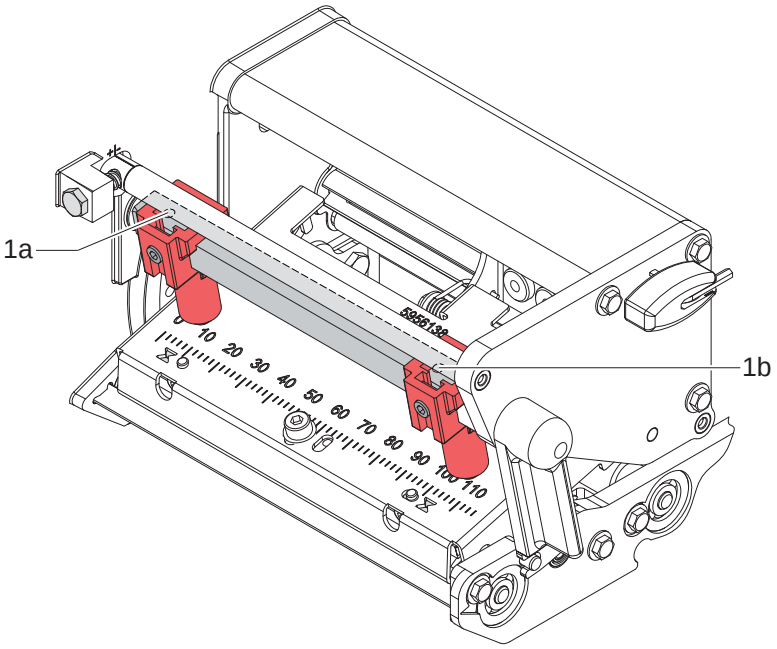



Fig. 24 Adjusting the printhead pressure

1. Turn the adjustment screws (1) counterclockwise until turning becomes perceptibly easy.
2. The heat level is to be reduced in the printer configuration until the print image is only barely recognizable. Under these conditions, inaccuracies become clearly visible during adjustment.
3. Create print samples with the test function `Test grid` (▷ Configuration Manual) or a similar print pattern.
4. Adjust the adjustment screw (1a or 1b) clockwise in small increments on the side with the weaker print image until the print image is even across the entire width. It may happen that you must turn the adjustment screws in an alternating fashion, resulting in a print image which is too light overall.
5. When the print image is set evenly, continue with setting of the transfer ribbon feed path ▷ 5.2.4 on page 25.

### 5.2.4 Adjusting the Transfer Ribbon Feed Path

You can adjust the transfer ribbon feed path by changing the head contact pressure and adjusting the transfer ribbon deflection. Increasing the head contact pressure with the screws (3a) and (3b) shifts the ribbon feed path in the corresponding direction. The skew of the transfer ribbon deflection is used to suppress wrinkles in the transfer ribbon feed path. Wrinkles which cannot be remedied with the skew of the transfer ribbon deflection can be suppressed by bowing the printhead.

**Attention!**

**The printhead assembly can be damaged when bowing the printhead.**

**Turning the adjustment screw (1) too hard can cause damage to the printhead assembly.**

- ▶ **As soon as you perceive clear resistance when turning the adjustment screw (1), you may only continue turning the screw in very small increments, but no more than one eighth of a turn.**
- ▶ **Only turn the adjustment screw (1) as far as is absolutely necessary.**

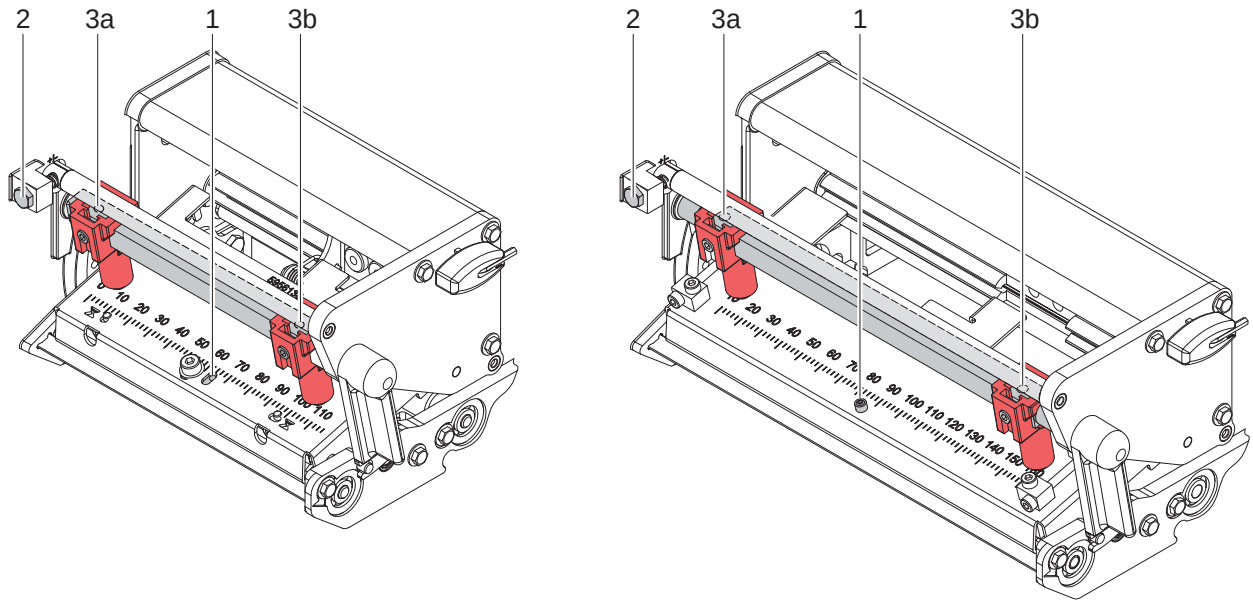



Fig. 25 Adjusting the transfer ribbon feed path

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 roll is from the disk of the supply hub.
2. If the ribbon runs inward or outward, turn the corresponding screw (3a) or (3b) 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 wrinkles arise on the inside, turn the screw (2) counterclockwise.
6. If wrinkles arise on the outside, turn the screw (2) clockwise.
7. If the wrinkles cannot be remedied (e.g. wrinkles in the center), turn the adjustment screw (1) clockwise **with extreme care** using an Allen key (1.5 mm) and observe the ribbon feed path.
   When the adjustment screw (1) is tightened, the printhead is bent downward slightly in the center. It is possible that a slight lightening at the edge areas of the print image could occur here.
8. If bowing is not necessary, turn the screw (2) clockwise until the screw is just barely clamping.
9. When the transfer ribbon feed path is set, continue with the final test.

### 5.2.5 Final Test

- ▶ Reset the `Heat level` to 0 in the printer configuration ▷ Configuration Manual.
- ▶ Recheck the setting with the test function `Test grid` (▷ Configuration Manual) or a similar print pattern.

When using standard cab media, the test printout must show lines with sharp contours and black areas without any parts missing.

## 5.3 Adjusting the Belt Tension at the Main Drive Motor

**Danger!**

**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

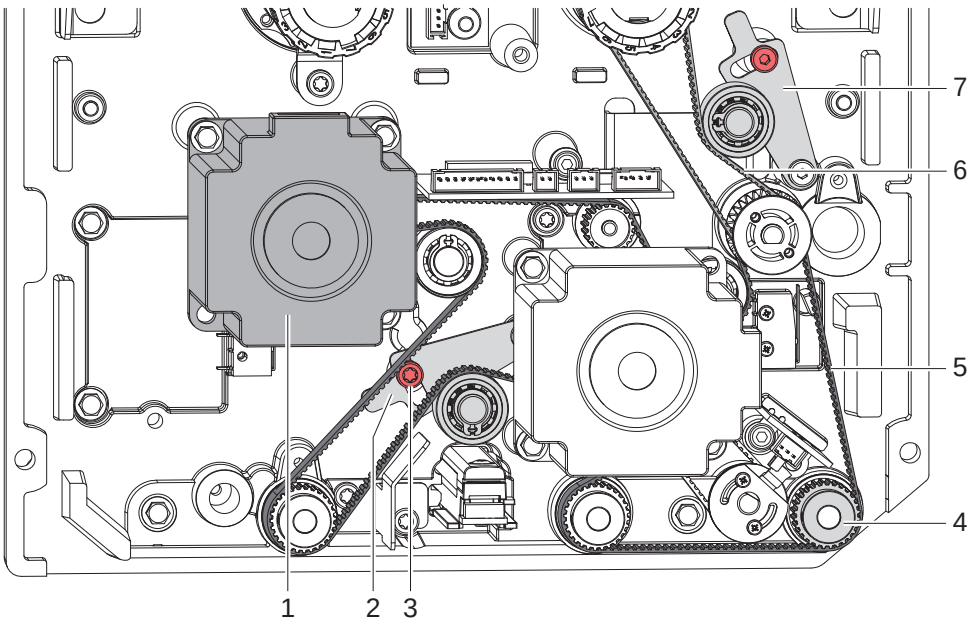



Fig. 26 Adjusting the belt tension

1. Unplug the printer from the electrical outlet.
2. Remove the cover ▷ 2.2 Cover dismount / mount.
3. Loosen screw (3) of the belt tension bracket (2) to adjust the tension of belt (5) between motor and print roller (4) .
4. Swing the belt tension bracket (2) so that the toothed belt (5) is is tensioned tightly between motor and print roller (4).
5. Tighten screw (3) in this position of the belt tension bracket .
6. Adjust the tension on the toothed belt (6) to the ribbon take up hub with belt tension bracket (7) in the same manner.
7. Mount cover again.

## 5.4 Adjusting the Head Switch

The head switch prevent printing from occurring when the printhead is open or the retraction roller isn't closed.

Adjust the head switch if the error message Head open appears in the display even though the printhead is locked.

**Danger!**

**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

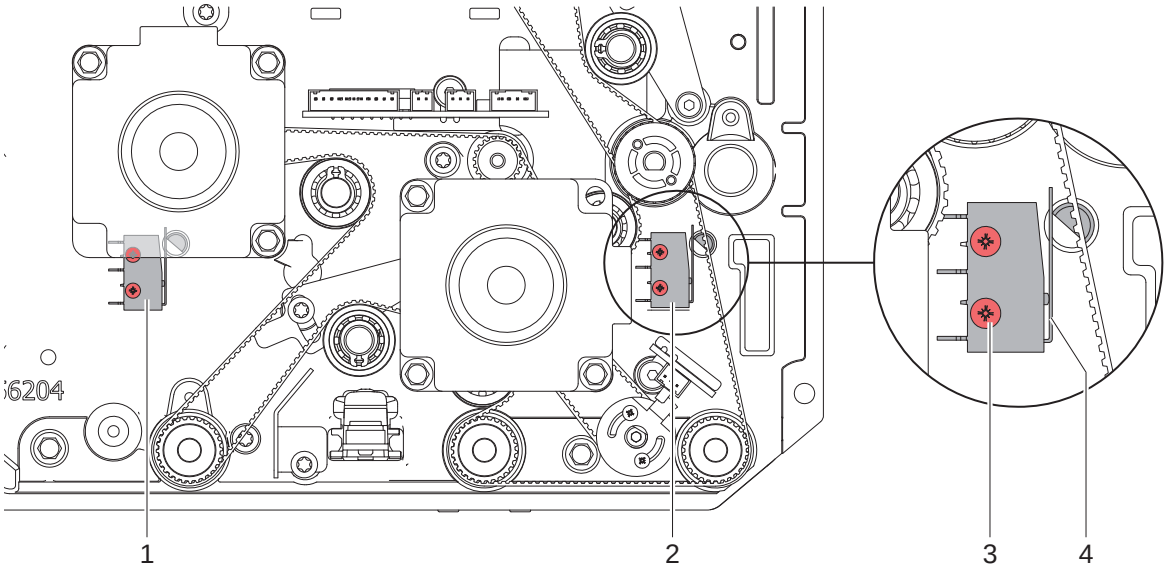



Fig. 27 Adjusting the head switch

1. Unplug the printer from the electrical outlet.
2. Remove the cover ▷ 2.2 Cover dismount / mount.
3. Lock printhead and pinch roller.
4. Slightly loosen the fixing screws (3) of the head switch (1 or 2).
5. Move the head switch housing and switching lever (4) to a parallel position (see magnified cutout).
6. Fix the head switch in this position.
7. Check whether the Head open message is still shown in the display. If this is the case, replace the switch with cable.
8. Mount cover.

## 5.5 Adjusting the Magnetic Clutch

A misaligned magnetic clutch can cause a very high and not adjustable torque at the ribbon supply hub.
The distance between chassis of the magnetic clutch (2) and the armature disk (3) must be 0.1 mm .

**Danger!**

**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

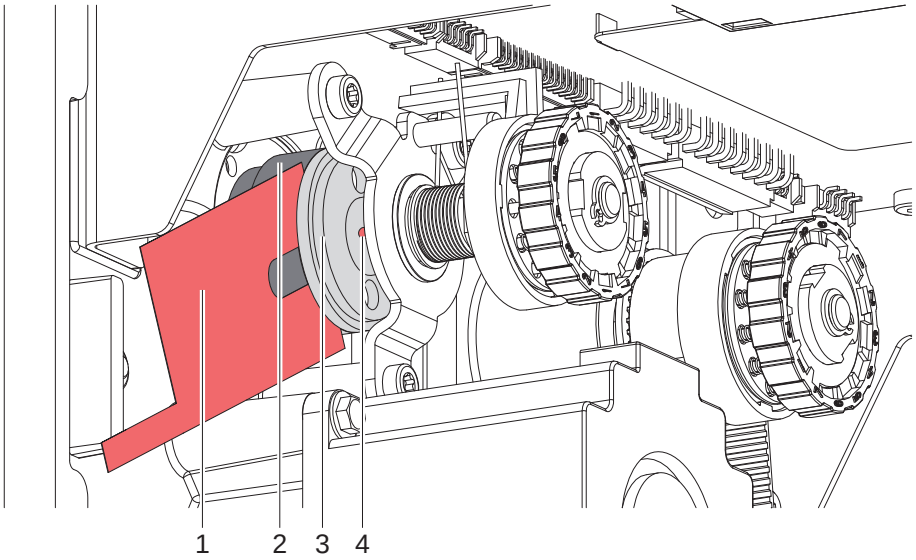



Fig. 28 Adjusting the magnetic clutch

1. Unplug the printer from the electrical outlet.
2. Remove the cover ▷ 2.2 Cover dismount / mount.
3. Loosen screw (4).
4. Pull armature disk (3) in direction to the slipping clutch.
5. Insert the distance caliber 0.1 mm (1) between armature disk (3) and chassis of magnetic clutch (2) .
6. Slide armature disk (3) against the chassis so that the distance caliber (9) will clamp easily and tighten screw (4).
7. Remove the distance caliber 0.1 mm (1) .
8. Check the winding torque on the ribbon supply hub and adjust it if it's necessary.
9. Mount cover.

## 5.6 Adjusting the Ribbon Saver Mechanics

The saver automatic reduced the consumption of color ribbon, because in case of the saver mode the movement will interrupted by lifting the printhead. This operated by a eccentric, which is controlled by a light sensor. A failure in adjustment is possible if the transport of the ribbon is stopped generally or it will make all movements like the label material.

**Danger!**

**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

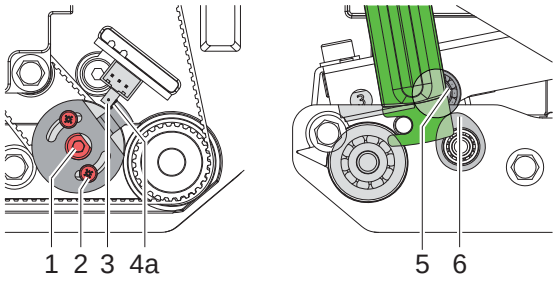



Fig. 29 Eccentric in saver mode

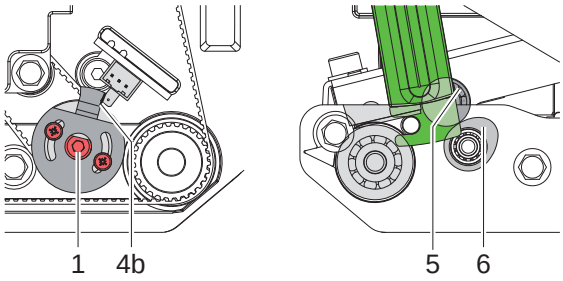



Fig. 30 Eccentric in print mode

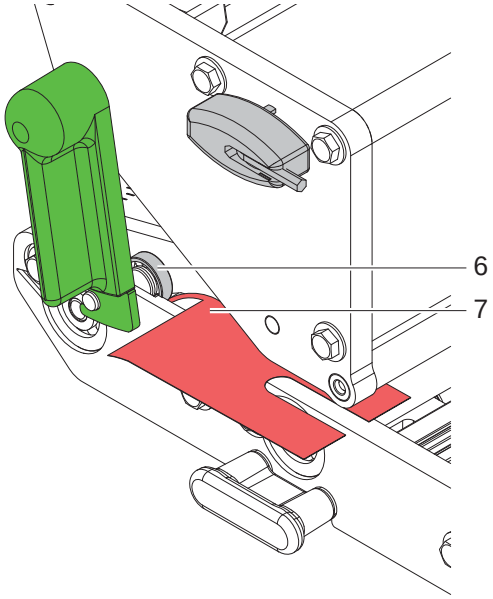



Fig. 31 Checking distance eccentric - ball bearing

1. Unplug the printer from the electrical outlet.
2. Remove the cover.
3. Lock the printhead.
4. Loosen the screws (2) at the clock wheel.
5. Turn axle (1) in such a way that the eccentrics (6) lift the printhead via the ball bearings (5) at most ▷ Fig. 29 right side.
6. Adjust a gap of ca. 1 mm between flange (4a) and the edge of the sensor housing (3) by turning the clock wheel ▷ Fig. 29 left side.
7. Tighten screws (2).
8. Turn axle (1) in such a way that there is a gap of 1 mm between flange (4b) and the other edge of the sensor housing ▷ Fig 30 left side.
9. Check the distance between ball bearing (5) and eccentric (6) with the caliber 0.1 mm (7).
10. Mount cover.

## 5.7 Configuring the Power Source for the OEM I/O Interface

The OEM I/O interface can be used with the internal or an external 5 V power source. When the module is delivered the interface is configured for the internal power source of the module. In order to isolate the interface from the internal power source, an external voltage must be connected.

To adapt the power source mode the setting of the jumpers at JP4 and JP5 must be altered.

**Danger!**

**Risk of death via electric shock!**

▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at lease one minute until the power supply unit has discharged.**

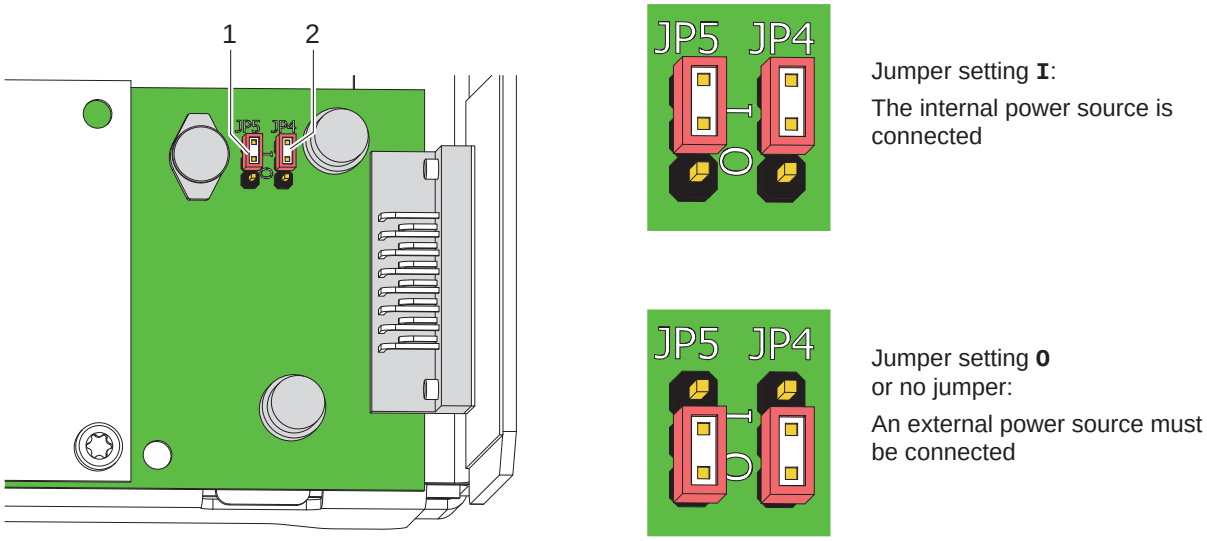



Fig. 32 Configuring the power source for the OEM I/O interface

1. Unplug the printer from the electrical outlet.
2. Remove the cover ▷ 2.2 Cover dismount / mount.
3. Set jumpers at JP4 and JP5 as shoen in fig. 32.
4. Mount cover.

## 6.1 Failure of Device Functions

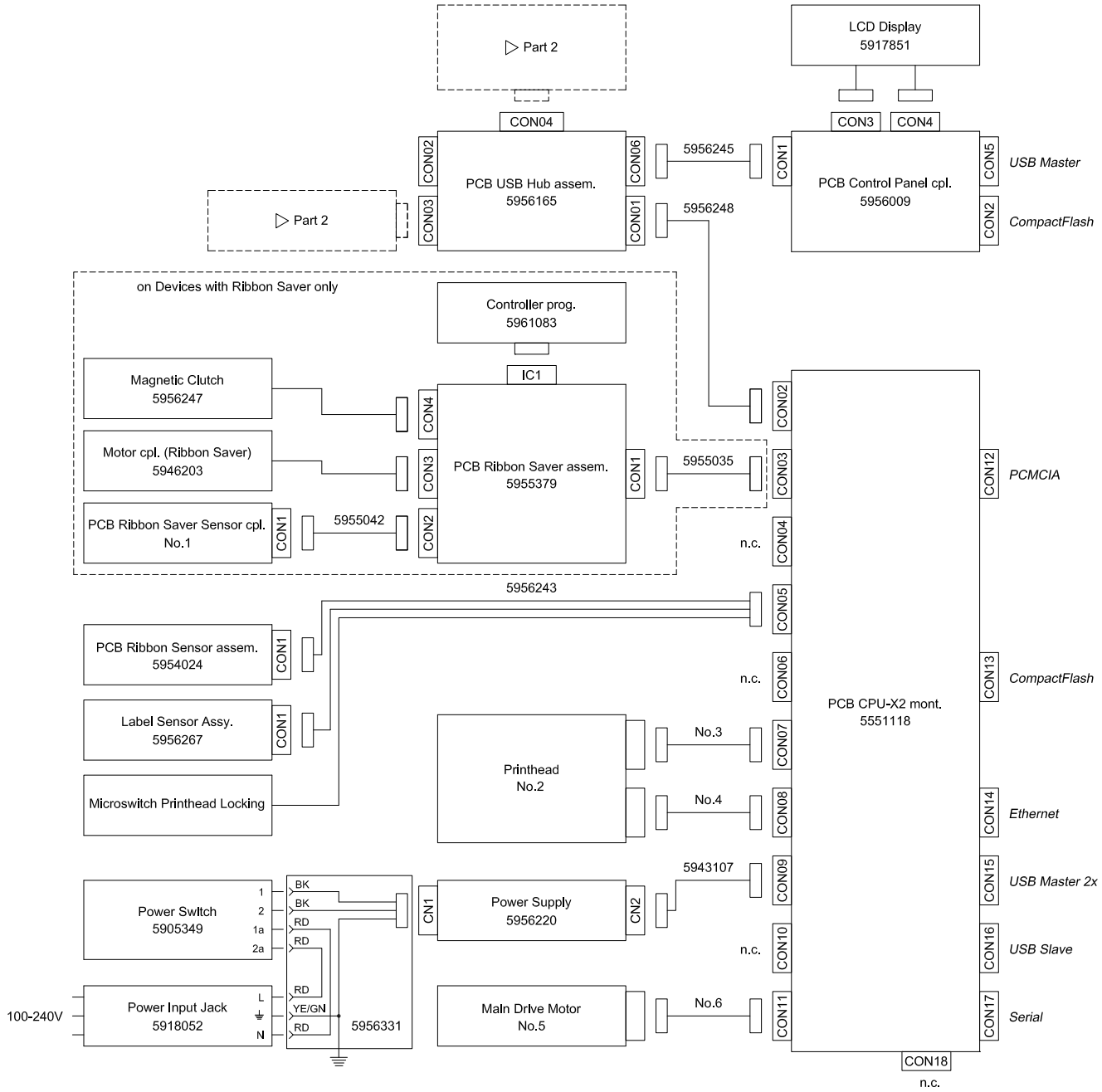
| Functional error | Possible remedy |
|---|---|
| Medium is not transported | Check electrical connections between PCB CPU and motor |
| | Check drive mechanism |
| | Replace the PCB CPU |
| | Replace the motor |
| No print image with medium transport | Check plug connections at the print head |
| | Examine print head cable for damage and replace if necessary |
| | Replace the print head |
| | Replace the PCB CPU |
| Display and navigator pad are not functioning | Check whether LED1 (green) is illuminating on the PCB CPU ▷ Fig. 36 on page 35:<br>• LED1 is not illuminating: The power supply unit or CPU PCB is defective. Replace PCB CPU or Power supply unit.<br>• LED1 flashes: Firmware update unsuccessful. Reload the firmware ▷ Configuration Manual |
| | Check cable connection between PCB CPU and control panel |
| | Check whether the correct voltages are active at the 3,3 V and 5 V measurement points on the PCB CPU ▷ Fig. 37 on page 36<br>• No voltage at either measurement point: The power supply unit may be defective. Replace the power supply unit<br>• No voltage at one measurement point: The PCB CPU may be defective. Replace the PCB CPU. |
| | Replace LCD Display cpl. |
| | Replace PCB Navi Button assem. |
| The display is not functioning, but the navigator pad is functioning | Replace LCD Display cpl. |
| The navigator pad is not functioning, but the display is functioning | Check the cable connection between LCD Display cpl. and PCB Navi Button assem. and replace if necessary |
| | Replace PCB Navi Button assem. |
| | Replace LCD Display cpl. |
| Communication via an interface is not functioning | Check whether the interface configurations of the printer and computer match |
| | For an Ethernet connection, check the validity of the IP address and the subnet mask |
| | Check the interface cable and replace it if necessary |
| | If all functionality of the interface has been lost, replace the PCB CPU |
| Communication via the interface on the PCB I/O Interface is not functioning | Check the cable and it's necessary change it. |
| | Replace PCB I/O Interface. |
| | Check connection between PCB USB Hub and PCB CPU . |
| | Replace PCB USB Hub. |
| Transport of ribbon is braked or doesn't braked in save mode | Adjustment of the eccentric is wrong. Adjust it new. |
| | Replace PCB- Ribbon Saver or PCB-Ribbon Saver Sensor |

Table 2 Failure of device functions

## 6.2 Hardware Faults

| Error message | Cause | Fault recovery |
|---|---|---|
| `ADC malfunction` | Fault on the PCB CPU | Replace the PCB CPU |
| `FPGA malfunction` | Fault on the PCB CPU | Replace the PCB CPU |
| `Invalid setup` | Fault on the PCB CPU | Replace the PCB CPU |
| `Voltage error` | | |
| $V_{BAT}$ | Voltage of the battery on the PCB CPU is too low | Replace the PCB CPU |
| $V_{MOT}$ | Motor voltage is too low | Check motor voltage (+38 V) at the measurement point $V_{mot}$ ▷ Fig. 37 on page 36:<br>• Voltage too low: Replace the power supply unit<br>• Voltage is correct: Replace the PCB CPU |
| `24 V` | 24 V too low | Check voltage at measurement point +24V ▷ Fig. 37 on page 36:<br>• Voltage too low: Replace the power supply unit<br>• Voltage is correct: Replace the PCB CPU |
| `24 V ext.` | 24 V at peripheral connection too low | Disconnect peripheral device<br>• Fault still exists: Replace the PCB CPU<br>• Fault remedied: Repair or replace peripheral device |

Table 3 Hardware faults




| | No.1 | No.2 | No.3 | No.4 | No.5 | No.6 |
|---|---|---|---|---|---|---|
| **PX4L/200** | 5955384 | 5956381 | 5956242 | 5956241 | 5965035 | 5952586 |
| **PX4L/300** | 5955384 | 5956382 | 5956242 | 5956241 | 5965035 | 5952586 |
| **PX4L/600** | 5955384 | 5956383 | 5956242 | 5956241 | 5965043 | in Nr. 5 |
| **PX4R/200** | 5955385 | 5956381 | 5954067 | 5956241 | 5965035 | 5952587 |
| **PX4R/300** | 5955385 | 5956382 | 5954067 | 5956241 | 5965035 | 5952587 |
| **PX4R/600** | 5955385 | 5956383 | 5954067 | 5956241 | 5946208 | in Nr. 5 |
| **PX4.3L/200** | 5955384 | 5956385 | 5954087 | 5954086 | 5965035 | 5952586 |
| **PX4.3L/300** | 5955384 | 5956384 | 5954087 | 5954086 | 5965035 | 5952586 |
| **PX4.3R/200** | 5955385 | 5956385 | 5954087 | 5954086 | 5965035 | 5952587 |
| **PX4.3R/300** | 5955385 | 5956384 | 5954087 | 5954086 | 5965035 | 5952587 |
| **PX6L/200** | 5955384 | 5954217 | 5954259 | 5954258 | 5965035 | 5952586 |
| **PX6L/300** | 5955384 | 5956322 | 5954259 | 5954258 | 5965035 | 5952586 |
| **PX6R/200** | 5955385 | 5954217 | 5954259 | 5954258 | 5965035 | 5952587 |
| **PX6R/300** | 5955385 | 5956322 | 5954259 | 5954258 | 5965035 | 5952587 |

Fig 33 Block diagram - Part 1

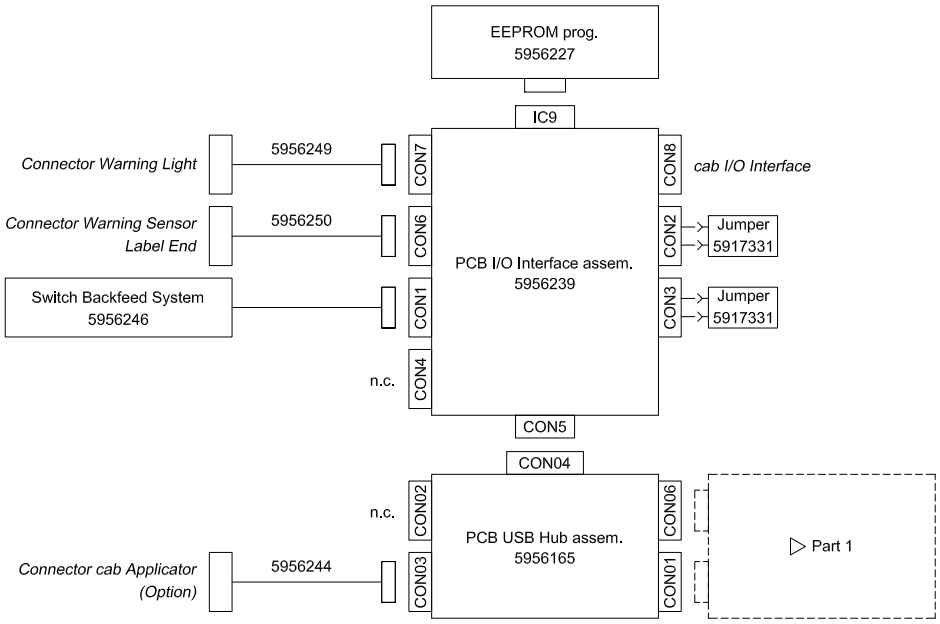



Fig. 34 Block diagram - Part 2 - Version with cab I/O interface

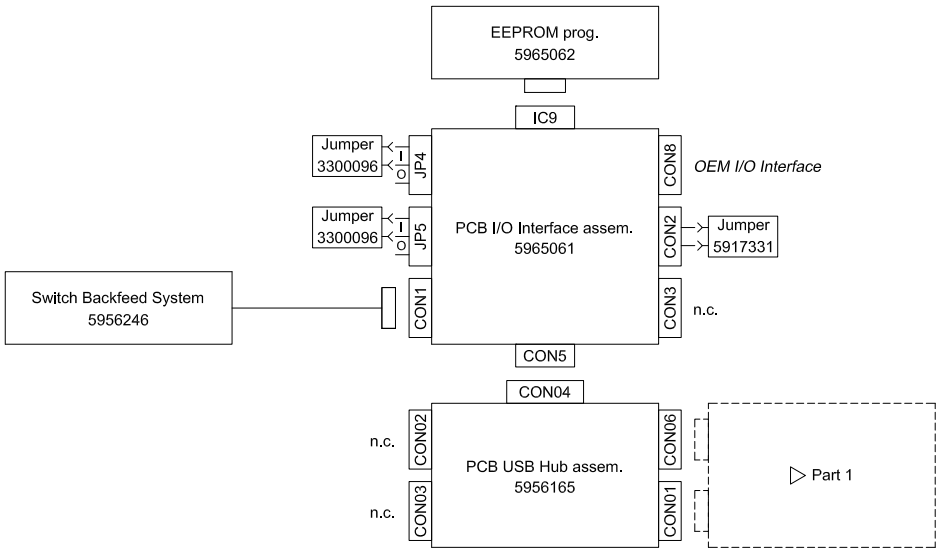



Fig. 35 Block diagram - Part 2 - Version with OEM I/O interface

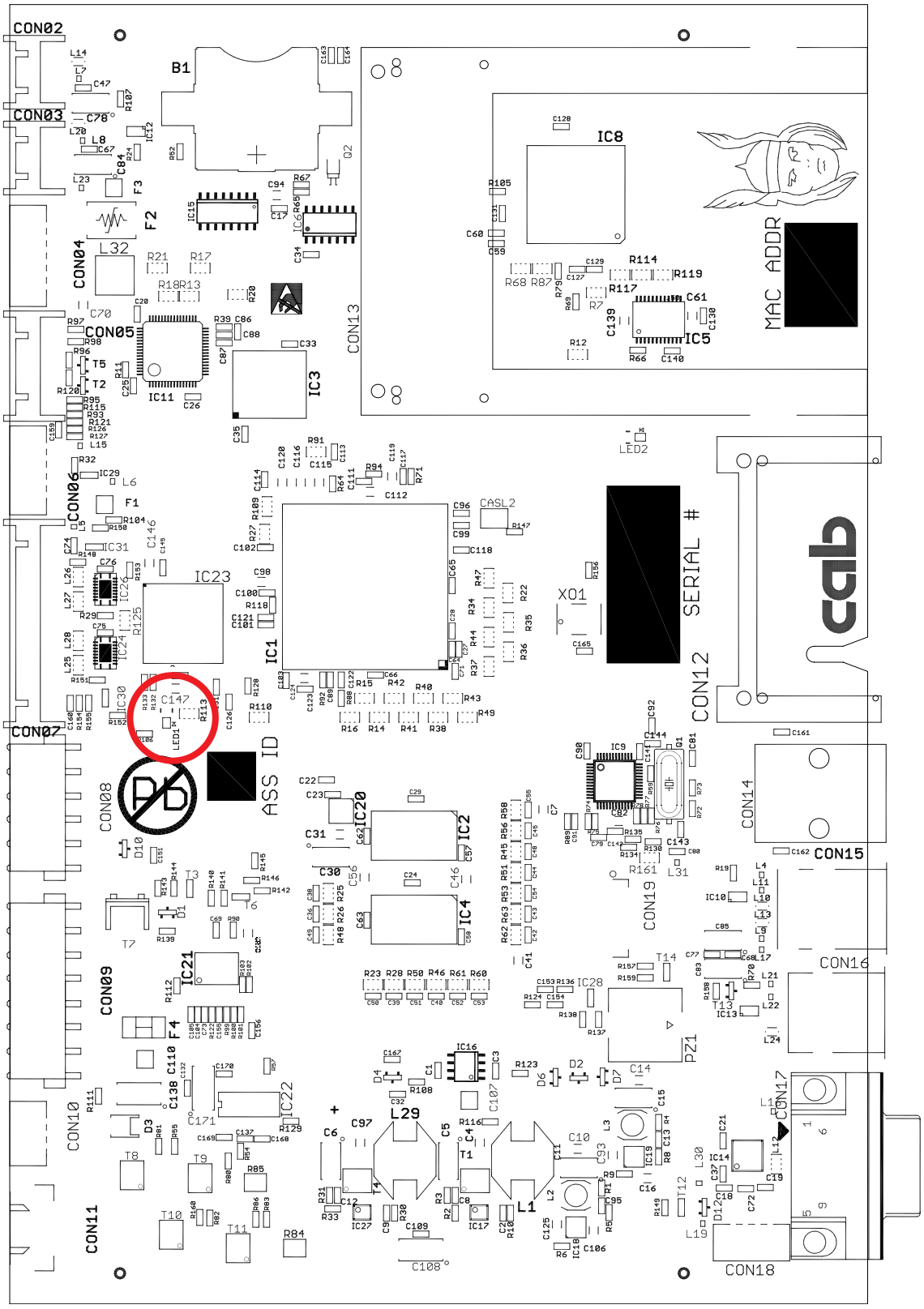



Fig. 36 Layout diagram PCB CPU - components side

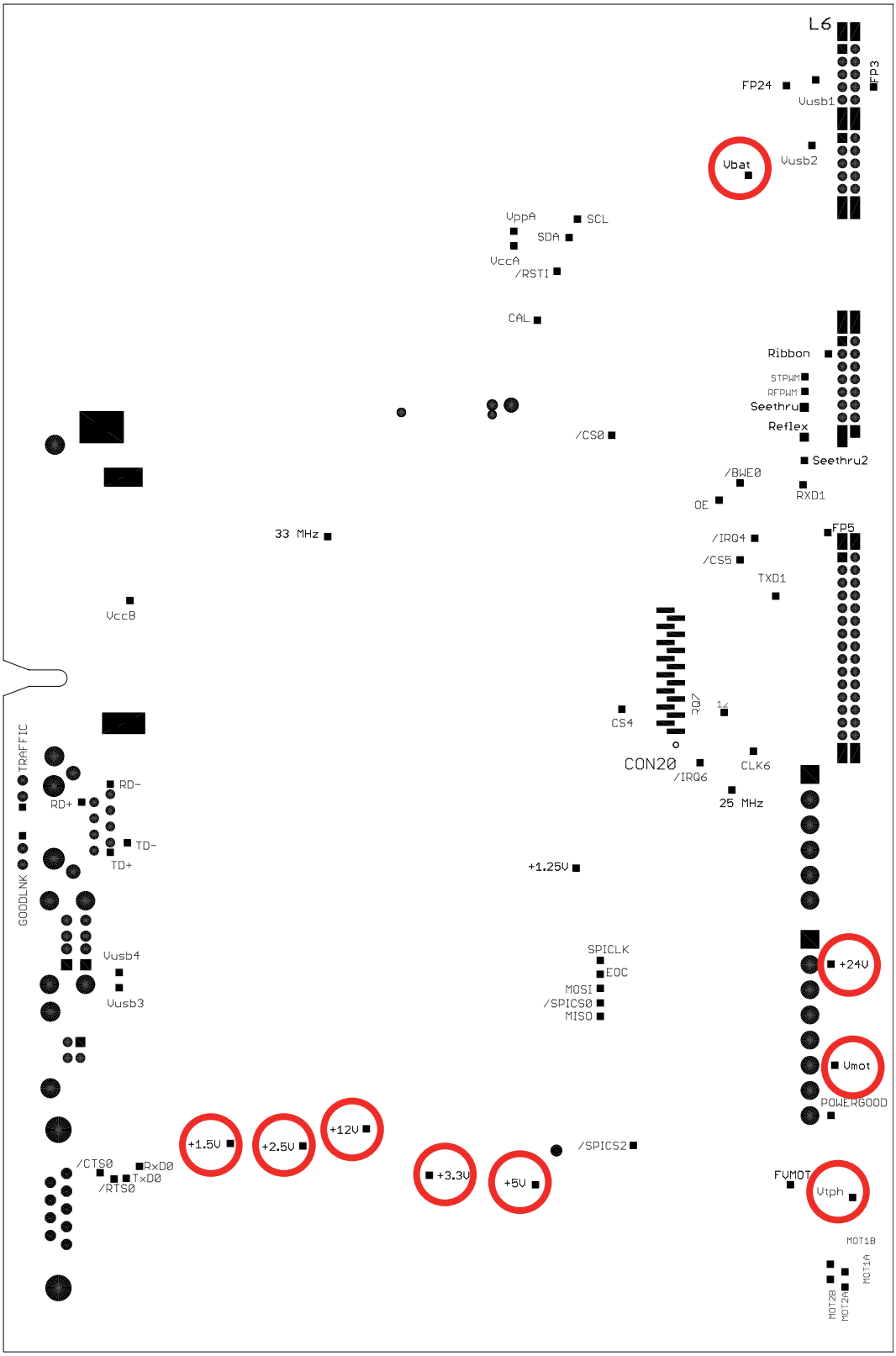



Fig. 37 Layout diagram PCB CPU - soldering side

# 9 Index


**A**

Accidents ..... 5

**B**

Belt Tension ..... 26
Block Diagram ..... 33
Brake ..... 13

**C**

Cleaning ..... 7
Clutches ..... 12
Cover ..... 6

**D**

Dispense Edge ..... 11
Distance Caliber 0.1 mm ..... 28

**E**

Electricity ..... 5
Error Treatment ..... 31

**F**

Failure of Device Functions ..... 31
Final Test ..... 25

**H**

Hardware Faults ..... 32
Head Switch ..... 27

**L**

Label Sensor
- Cleaning ..... 7
- Replace ..... 14

**M**

Magnetic Clutch ..... 28, 29
Motor ..... 26

**P**

PCB
- CPU ..... 15, 35, 36
- I/O Interface ..... 17
- Ribbon Saver ..... 16
- Ribbon Saver Sensor ..... 16
- USB Hub ..... 17

Power Source for the OEM I/O Interface ..... 30
Power Supply Unit ..... 18
Preparing the Printer ..... 22
Printhead
- PX4 ..... 8
- PX6 ..... 9

Printhead Locking System ..... 22
Printhead Position ..... 23
Printhead Pressure ..... 24
Printhead Replacement ..... 8
Print Image ..... 22
Printing Mechanism ..... 22
Protective Devices ..... 5

**R**

Ribbon Saver Mechanics ..... 29
Ribbon Supply Hub ..... 13, 20
Ribbon Take Up Hub ..... 13, 20
Roller ..... 11

**S**

Safety Instructions ..... 4
Sensor Ribbon Saver ..... 29
Slipping Clutch ..... 12, 21

**T**

Test Collar ..... 19
Tools ..... 6
Transfer Ribbon Feed ..... 22
Troubleshooting ..... 31

**W**

Winding Torque
- Adjustment ..... 21
- Measuring ..... 19

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38