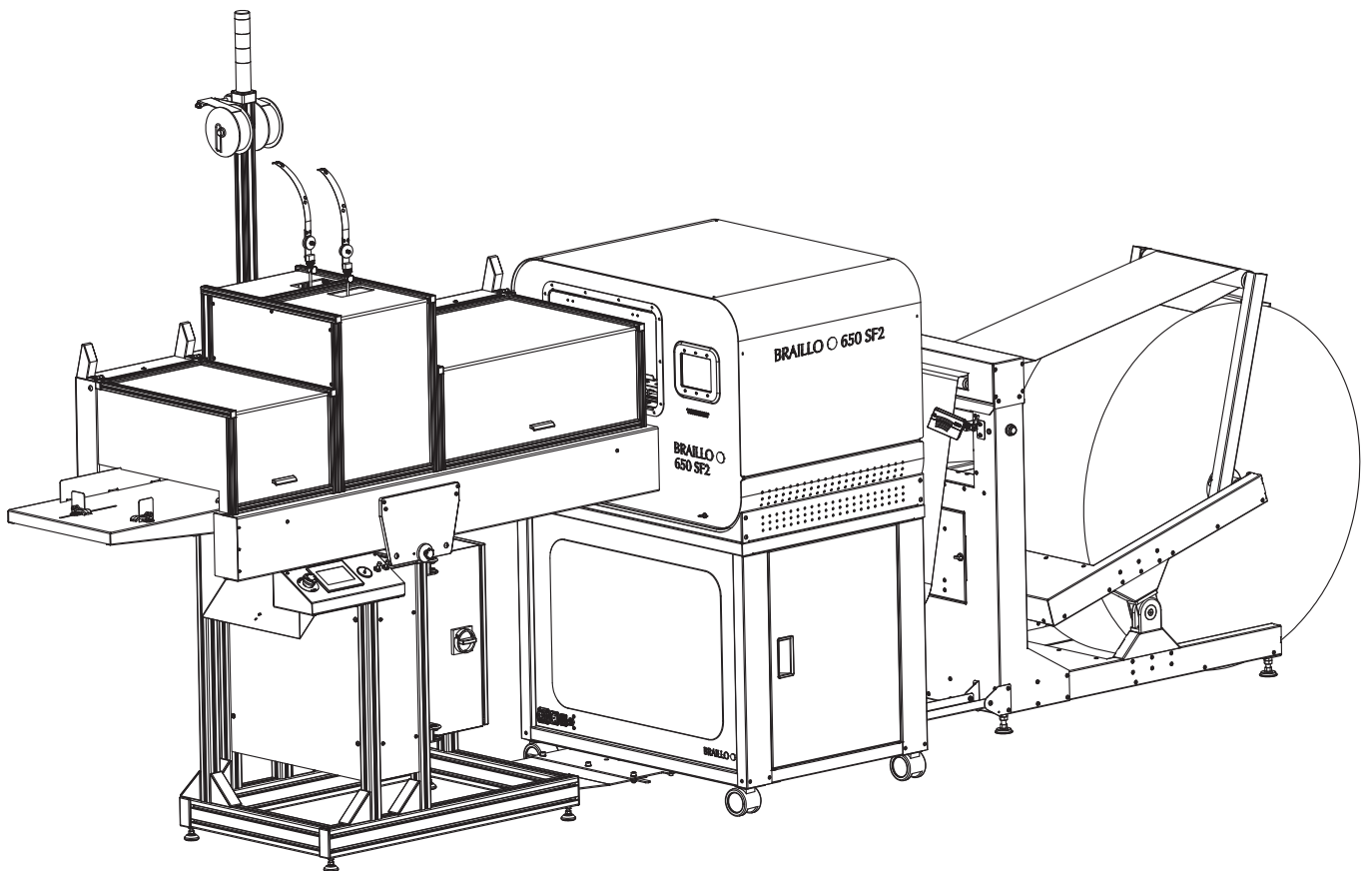


# BRAILLO 650 SF2.1



## User's Guide





Dear Valued Customer,

Thank you for purchasing a Braillo braille printer and placing your trust in our company and products.

I know that the purchase of a production braille printer is a big one, and we are proud that you have chosen us. You have joined a close community that includes the largest and most important braille production centers in the world.

Since 1980, Braillo has manufactured the finest braille printers available, many of which are still being used today. We provide a comprehensive warranty up to 4 years, which is unmatched in this industry. For further peace of mind, your Braillo is upgradeable, meaning that as technology changes, your printer will have the ability to change with it. Our goal is to manufacture a braille printer that when properly maintained by following the instructions in this manual, will not only last decades, but will also produce braille that is recognized as the highest quality available.

We rely on a close cooperation with our customers and we encourage your suggestions for improvements. Please take a moment to register your printer so we can provide a lifetime of technical support, updates and special prices.

Again, thank you for giving us this opportunity to serve you.

Best regards,

A handwritten signature in blue ink that reads "Patrick N. Nunnelly". The signature is stylized, with the first letters of the first and last names being prominent.

Patrick N. Nunnelly  
Managing director





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## 1. PRINTER BASIC

Thank you for your purchase of the Braillo 650 SF2.1. Please read this manual carefully before installing and operating this printer.

### Key features

- Prints interpoint, both sides of the sheet are printed simultaneously
- Specially designed to print 4 pages/sheet (like e.g. newspapers, magazines)
- Prints up to 650 characters per second
- Self-test system that checks the magnets continuously during printing
- Reliable, sturdy construction
- Safety switches will turn the printer off if someone accidentally opens the cover while printing
- The printed sheets will be stacked and a cover sheet (with both braille and ink print) can be added
- Then the stack is stapled, folded and ejected

### Maximizing the operational life of your Braillo printer

Many 30-year-old Braillo printers are still in daily operation – a testament to their quality. To maximize the life of your Braillo printer, we strongly recommend using the correct tools, which come with your printer; as well as following the correct procedures, which we prescribe in the manual and reinforce in our training courses.

Additionally, just as the wrong wrench can ruin a nut, using poor quality braille paper can ruin the printer's pins, print shoes and moveable parts by causing them to wear out prematurely. Failures due to user negligence of this nature, just as repairs carried out by untrained personnel, may compromise your warranty rights.

Braillo recommends using our specialized braille paper and having your printer serviced by certified technicians who have successfully completed our training course.

More information regarding our training courses can be found on our website:

<http://braillo.com/braillo-services/>  
<http://braillo.com/event-registration/>

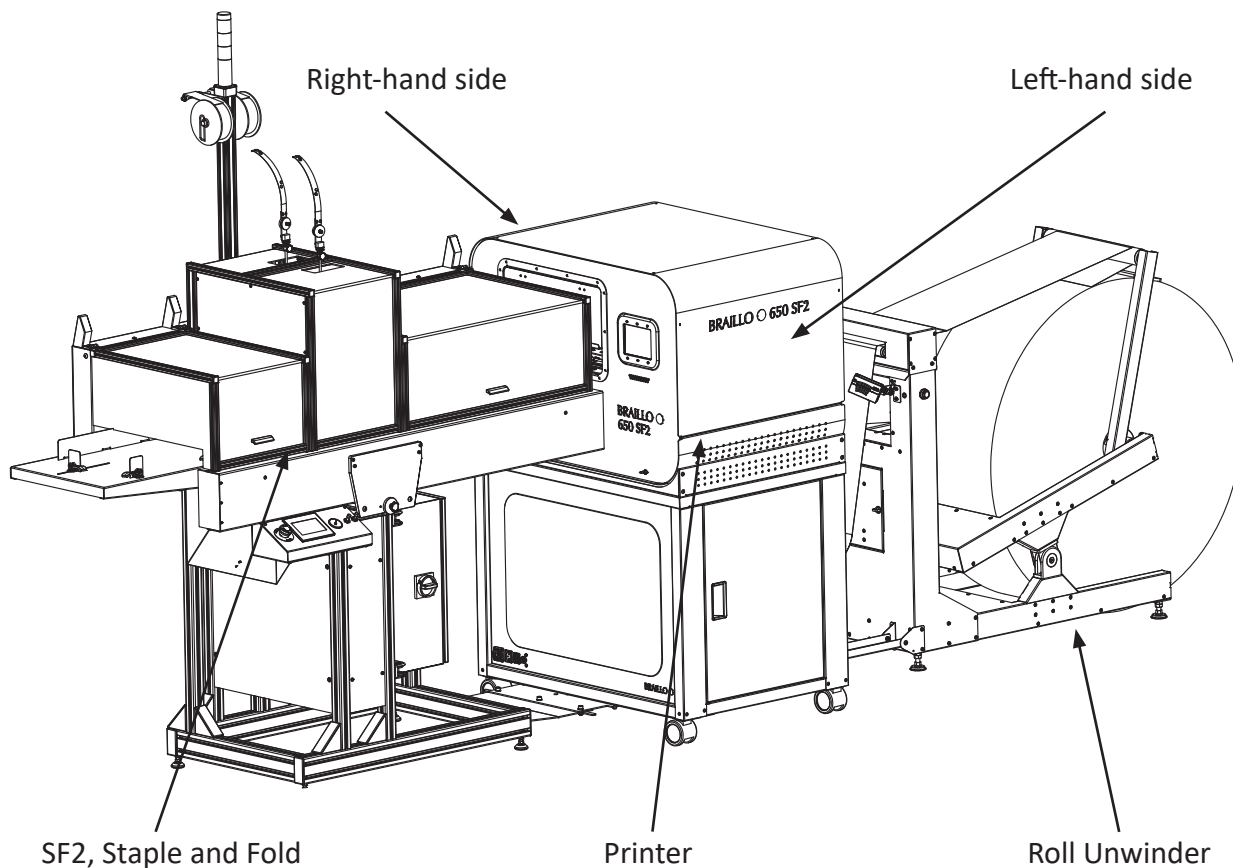
More information on our braille paper can be found on our websites:

<http://braillo.com/braille-paper/>  
<http://braillepaper.com/>

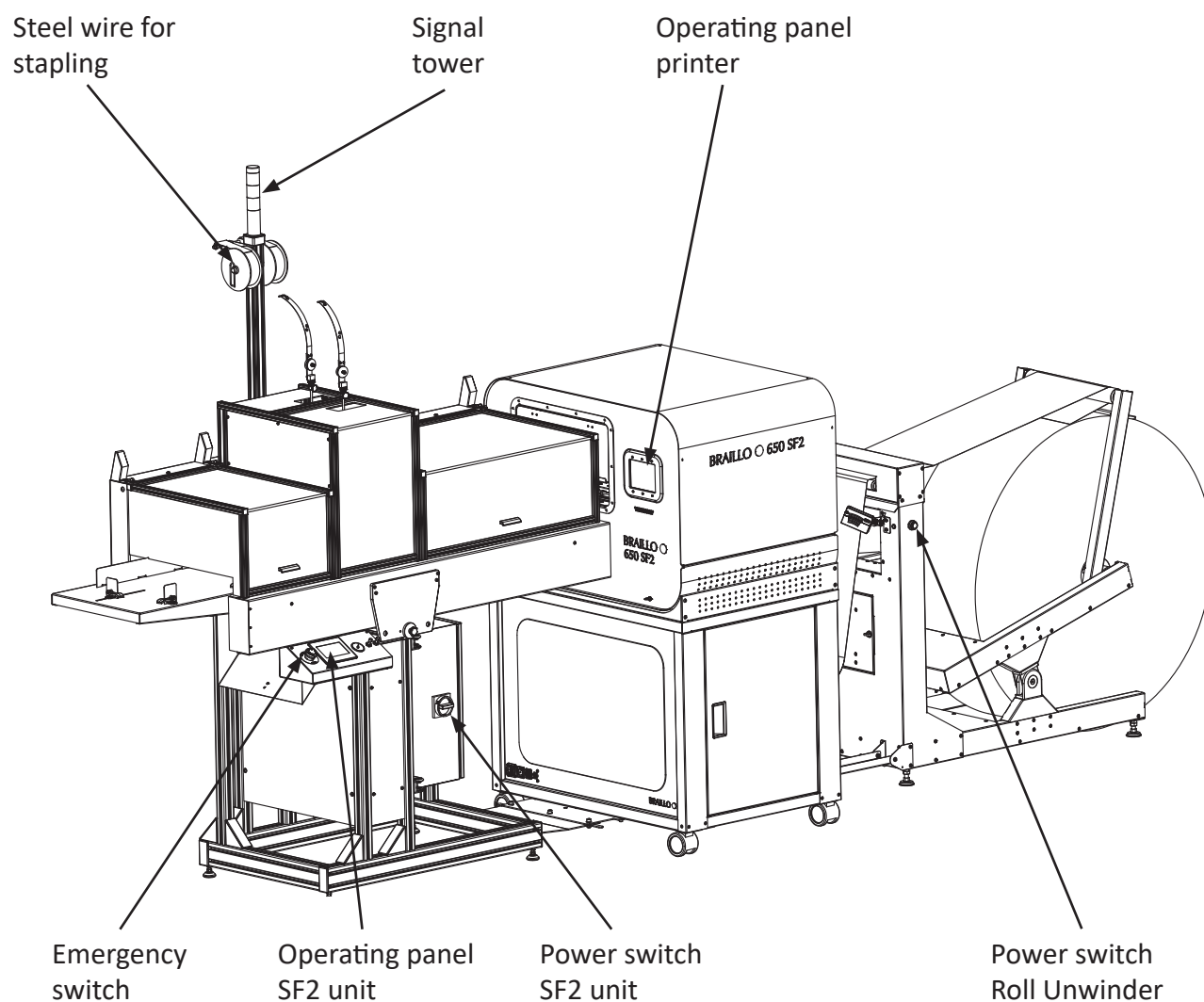
## Printer overview

Please see the figure below.

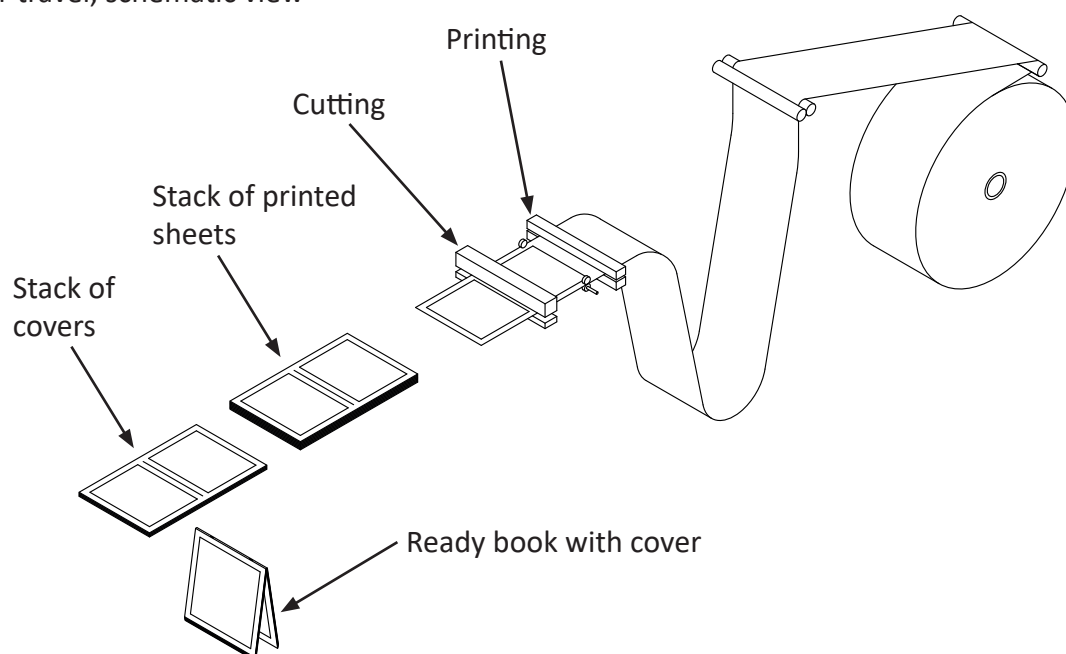
Note that the right-hand and left-hand side are referred to as if you were standing behind the printer facing the opening where the paper is inserted into the printer.



## Printer overview, continued



## Paper travel, schematic view



## 2. INSTALLATION

### Space

The minimum space required for the Braillo 650 SF2.1 is approximately 6 x 3 m (19.5 x 10 feet). It's required at least 1.5 m free space behind the Roll Unwinder so that the paper roll can be replaced. Also keep 1 m free space on both sides so that it can be properly operated, cleaned and maintained.

### Environment

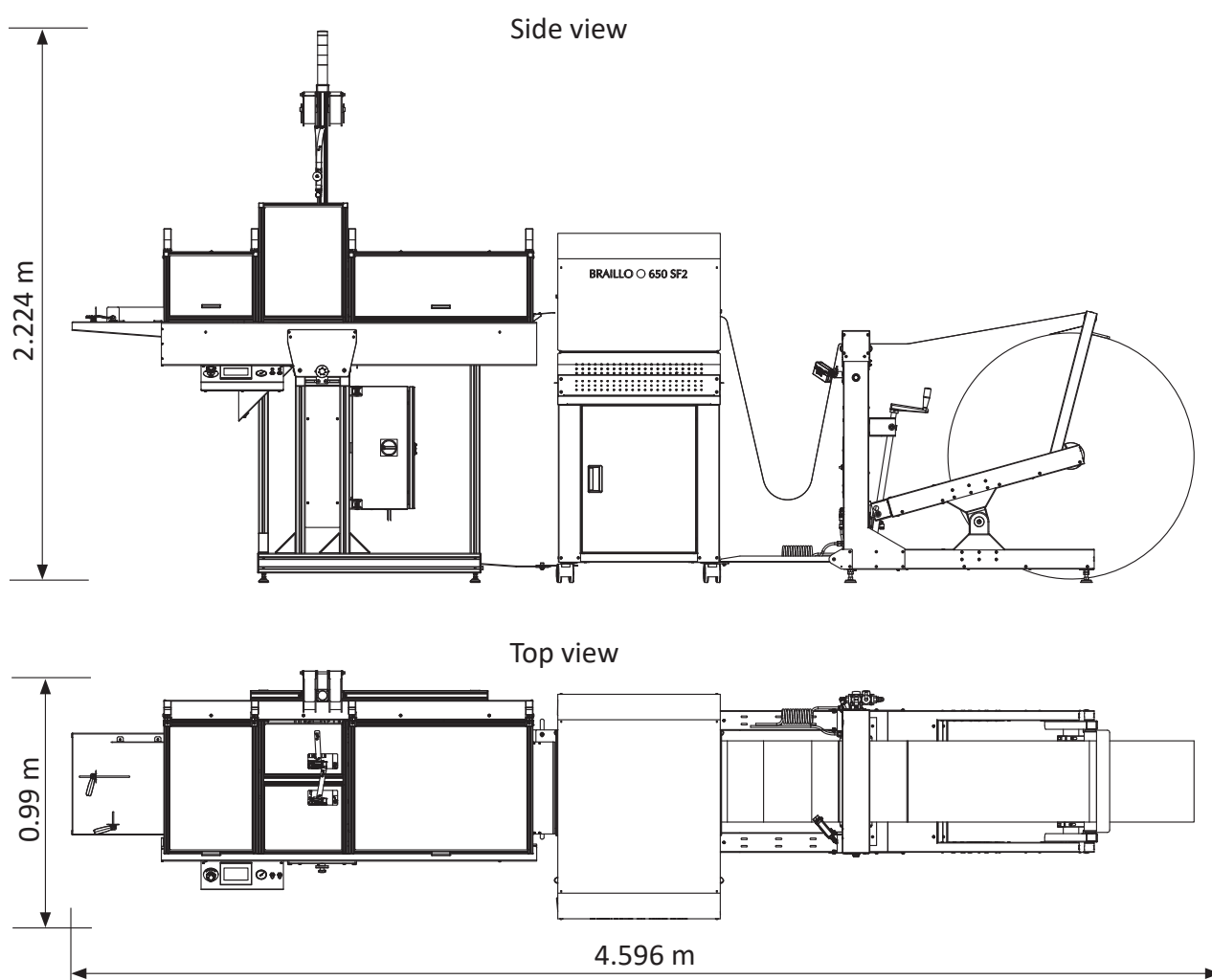
Braillo printers are made to operate continuously and to be reliable for many years. However, sensitive electronic and mechanical parts require a suitable installation environment to ensure long and trouble-free operation. Temperature should be between 15° - 30° C (60° - 86° F), and relative humidity between 40 % and 60 %.

Maintain a clean environment because dust may clog the printer - especially when combined with high humidity! Too low humidity should also be avoided to prevent electrostatic problems. Some paper qualities may generate excessive paper dust. This should be removed with a vacuum cleaner and a damp cloth. (About every 50,000 sheets).

### Electrical

Single phase 230 volt (+/- 10%), 50/60 Hz, circuit breakers should be min. 6 amps.

Be sure to consult your distributor/supplier for further details concerning the installation site. Failure to meet the installation requirements may relieve the supplier of any warranty responsibilities.



## 2.1 Unpacking

Unpacking and installation can be done by the user.

Any kind of lifting of the printer must always be done from the base of the printer, and should be done with extreme care.

Make sure that your Braillo printer has not been damaged in transport. Check if the packing is damaged; If so, it's possible that the printer has also been damaged or scratched. If any damages are found, please contact your distributor or Braillo Norway AS immediately.

The total shipment consists of three pallets (or four, if the compressor is enclosed), make sure that the following items are enclosed.

Together with the printer

- Power cable for the printer
- Data cable, USB
- Data cable, ethernet
- User's guide
- Tool kit for service and maintenance

Together with the Roll Unwinder

- Roll with paper sample
- Friction bar with correction roll
- Guides for the friction bar
- Shaft for the paper roll
- Stapler unit for the SF Unit
- Protection cover for the SF Unit

The SF2 Unit

Compressor (Optional)

If any of these items are missing, please contact your distributor or Braillo Norway AS.



Important!

It's very important that the printer's specified voltage value, 230V, +/- 10%, corresponds with the local mains power supply available.

If the plug on the mains power cable is to be replaced, note that the yellow/green wire is the grounding (earthing) wire.



Note! The printer must always be connected to ground!

After the printer is unpacked, we advise that the transport boxes are stored for possible later use.



## 2.2 Add the wheels to the printer

Place the wheels under the Stand, one in each corner.

This can be done simplest by following the procedure described below.

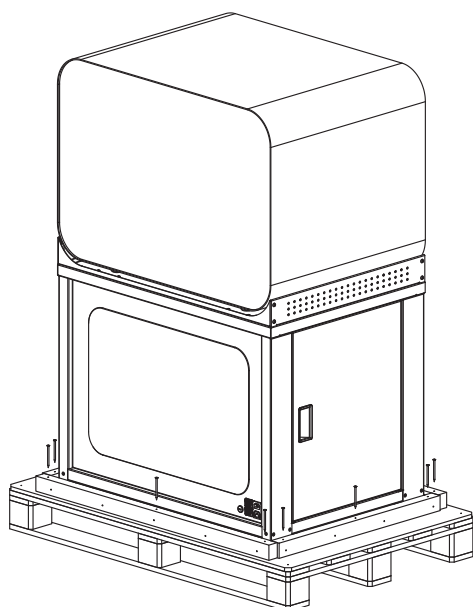
Make sure you are at least two persons while doing this!



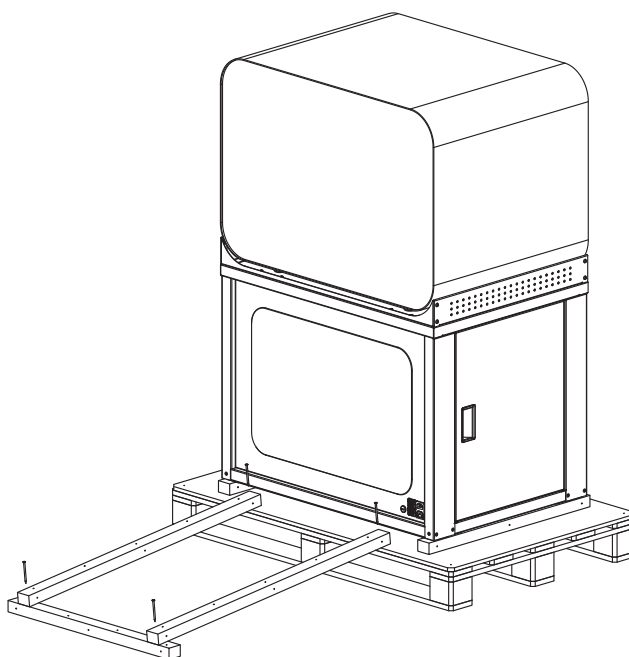
**Note!** Do not lay the printer on the side to mount the wheels!

### How to add the wheels on the Stand

1. Remove the packaging, then remove the wood strips

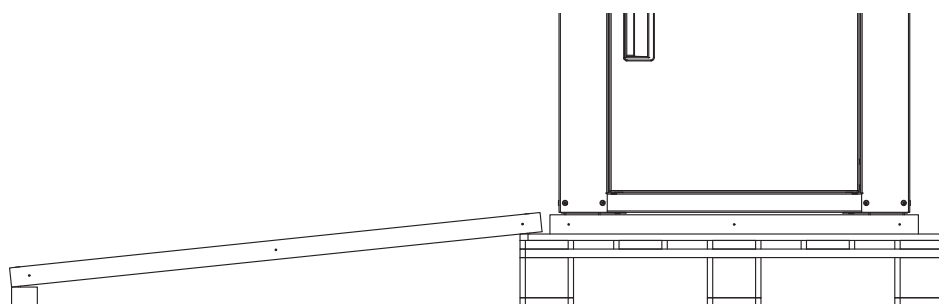


2. Remove the screws and the four wood strips around the printer

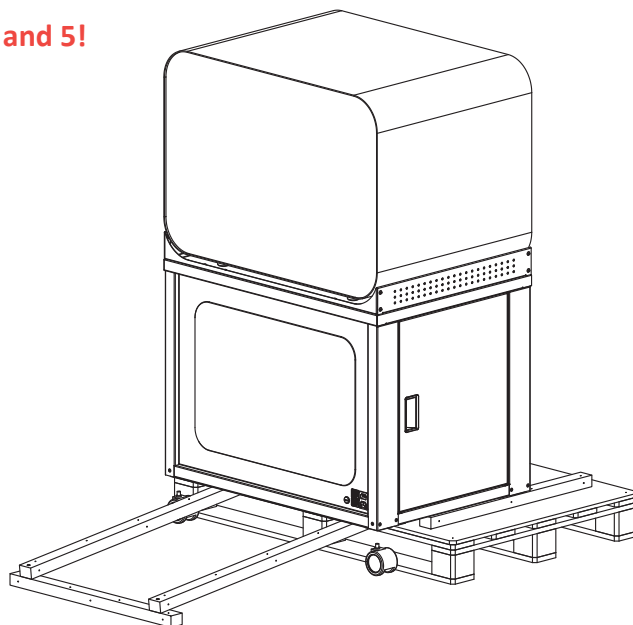


3. Make a slope by using the two long and one short wood strips, and place them like shown in the figure above.

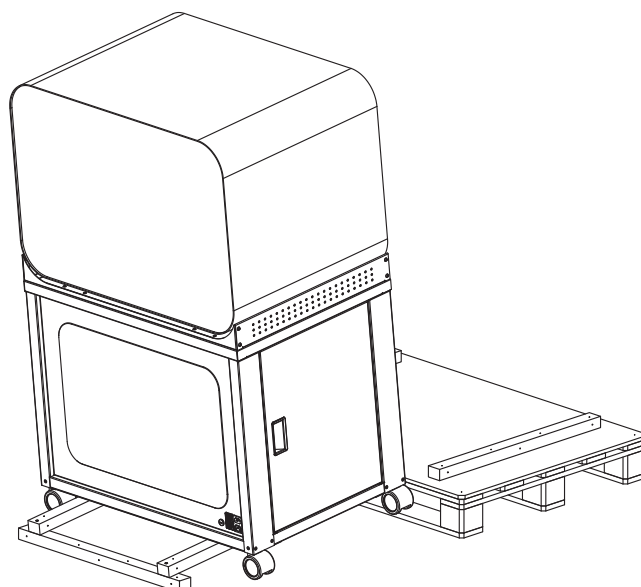
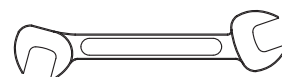
**Note!** Use screws to secure both ends on the long wood strips!



When done, it should look like this seen from the side

**Note!****Be two persons for step 4 and 5!**

4. Slide the printer carefully out sideways and mount the two first wheels. Use the thin 13 mm wrench from the toolbox to tighten the wheels.



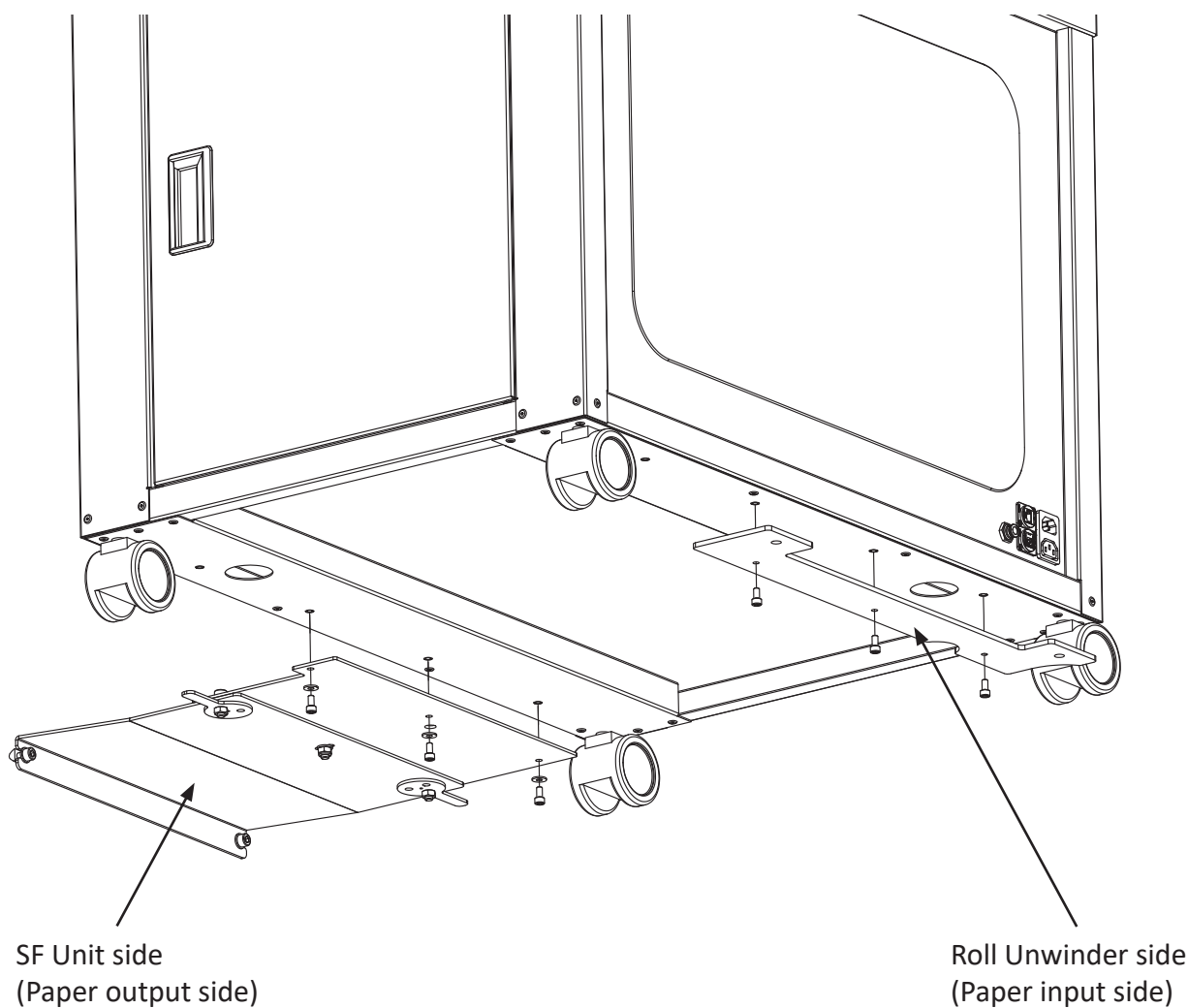
5. Then slide the printer further down the slope so the two last wheels can be mounted. Finally, pull it further down until the printer can roll out on the floor.

## 2.3 Add the connection plates under the printer

Place the connection plates under the printer as shown in the figure below.

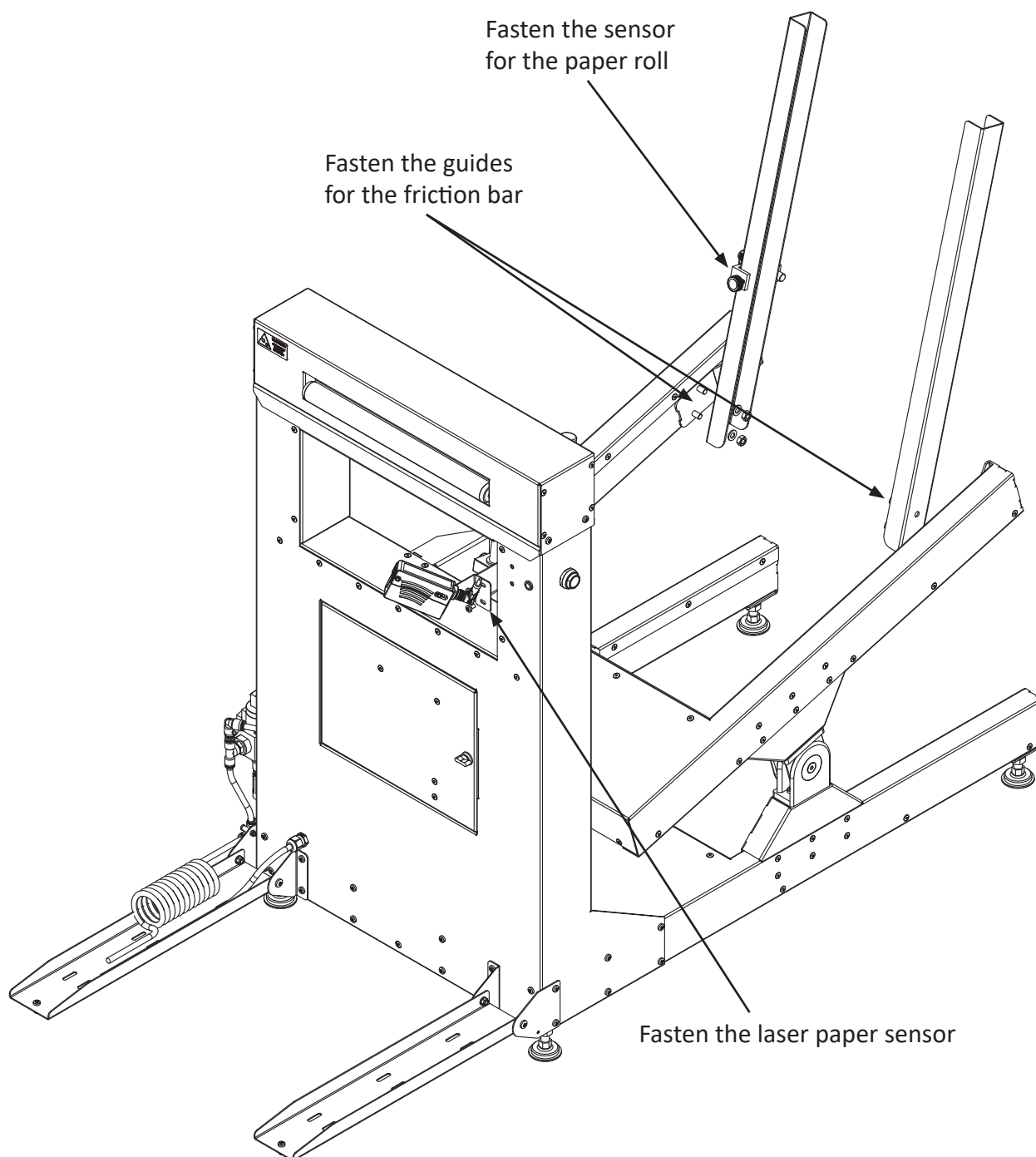


Note! Do not lay the printer on the side to mount the plates!



## 2.4 Assemble the Roll Unwinder

Fasten the laser paper sensor, and connect the cable. Then fasten the guides for the friction bar and the sensor for the paper roll.

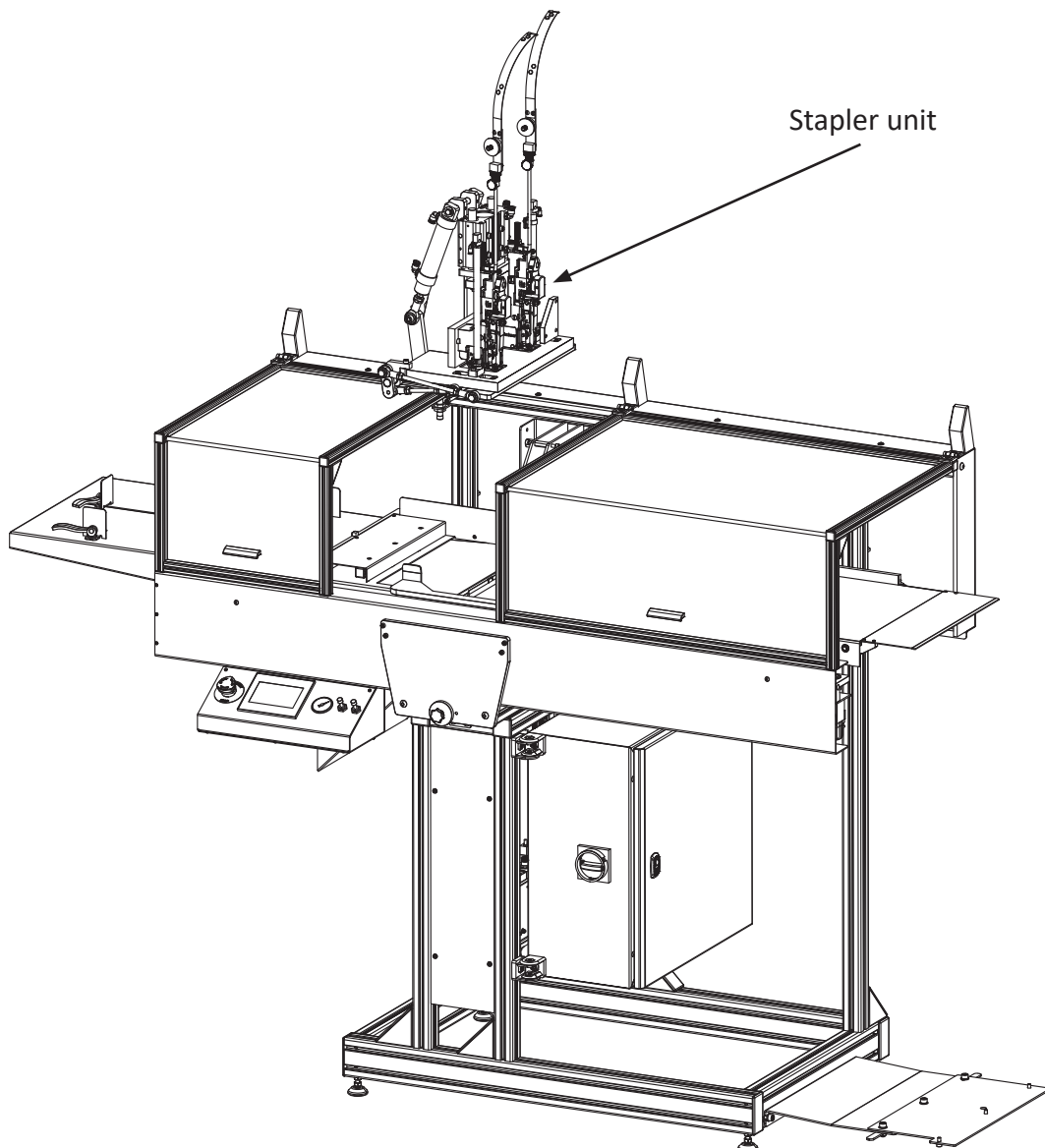


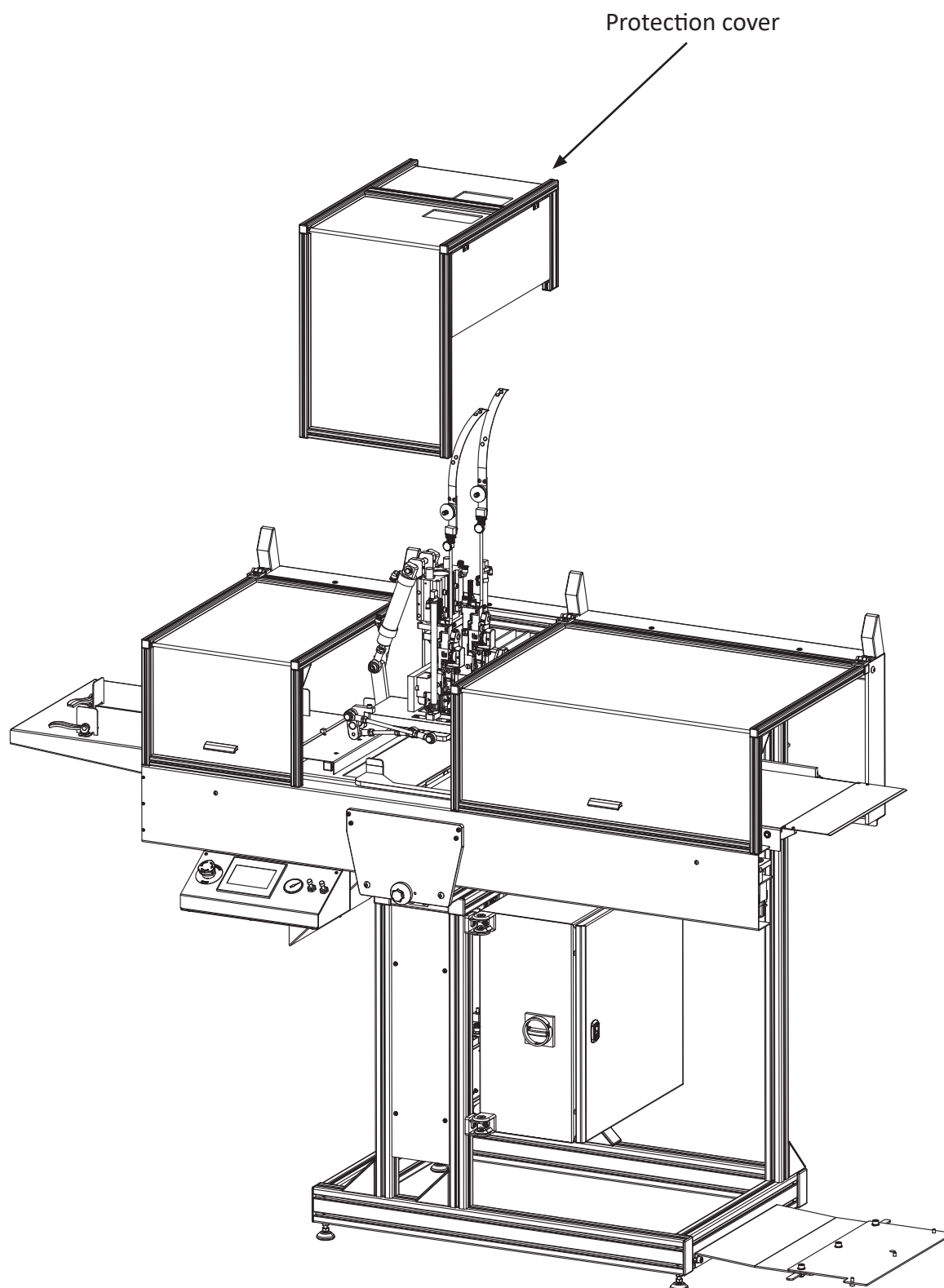
## 2.5 Assemble the SF2 Unit

Because of its height, the SF2 Unit's disassembled a little during shipping. The parts that need to be assembled are the Stapler unit, Protection cover, and the Signal tower.

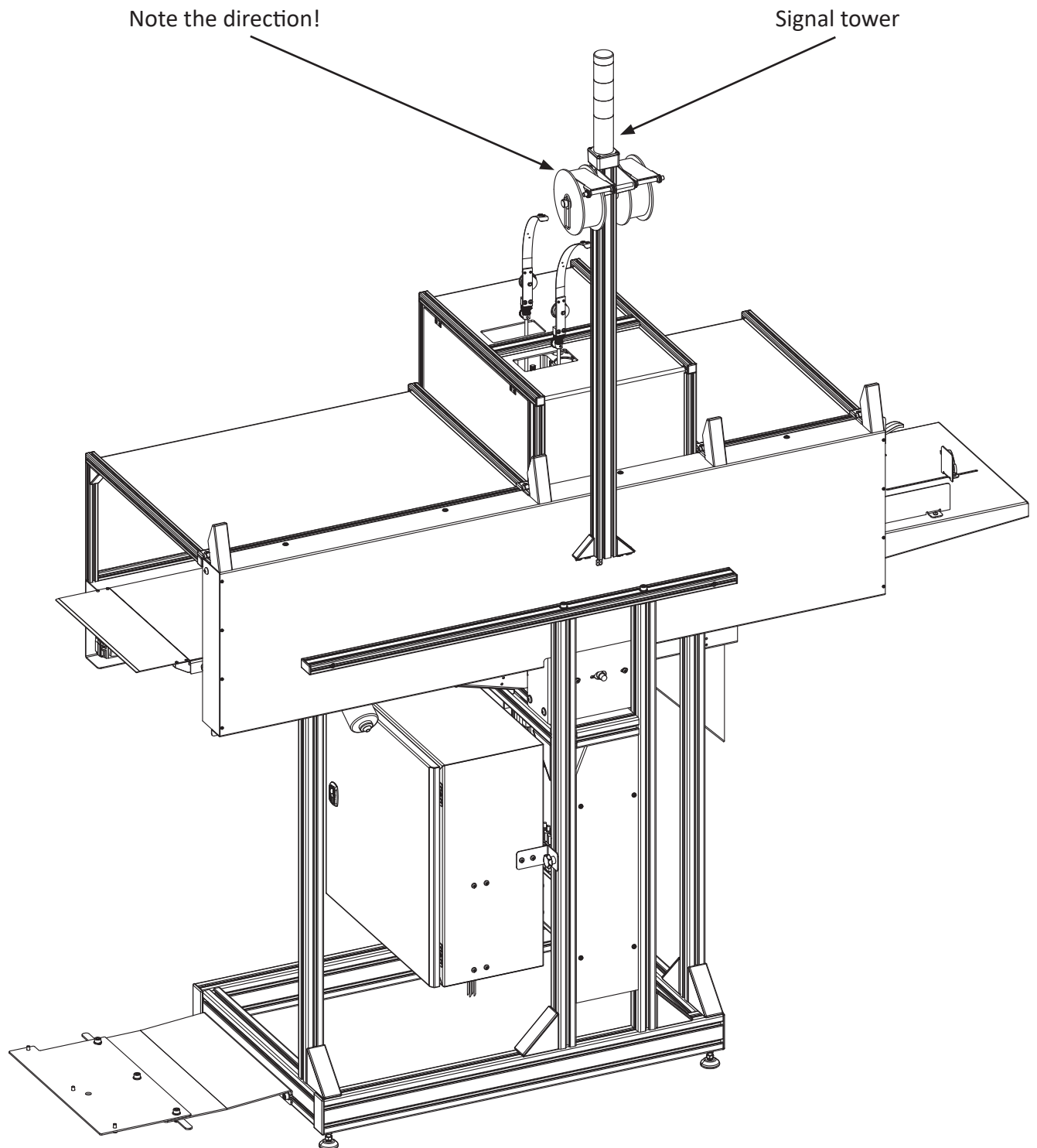
1. Add the Stapler unit
2. Add the Protection cover over the stapler unit
3. Add the Signal tower

### Step 1. Add the Stapler unit



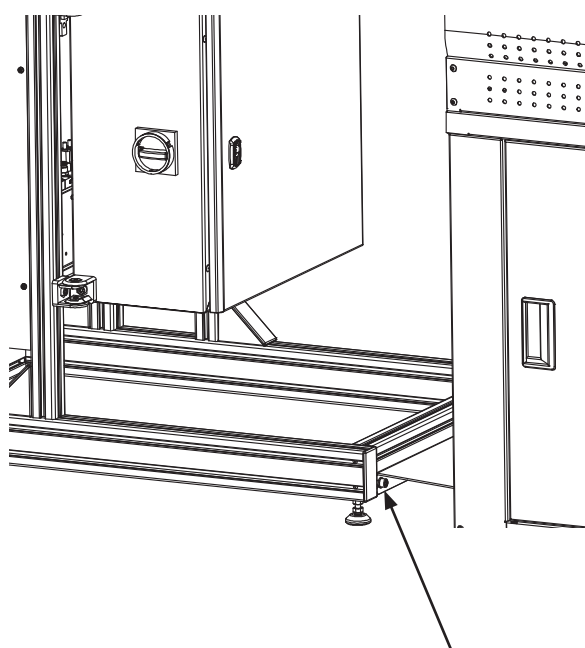
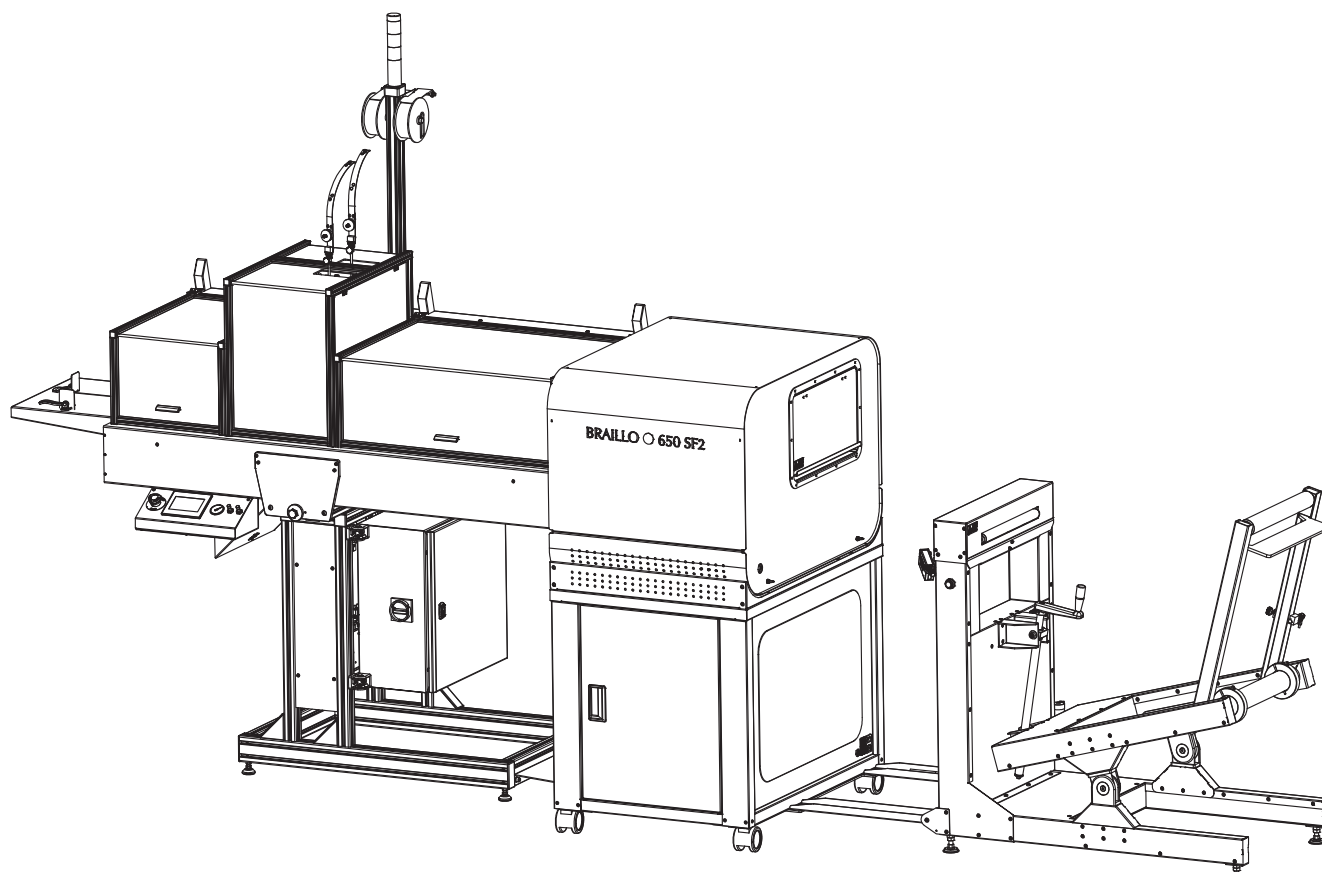
**Step 2. Add the Protection cover over the stapler unit**

### Step 3. Add the Signal tower



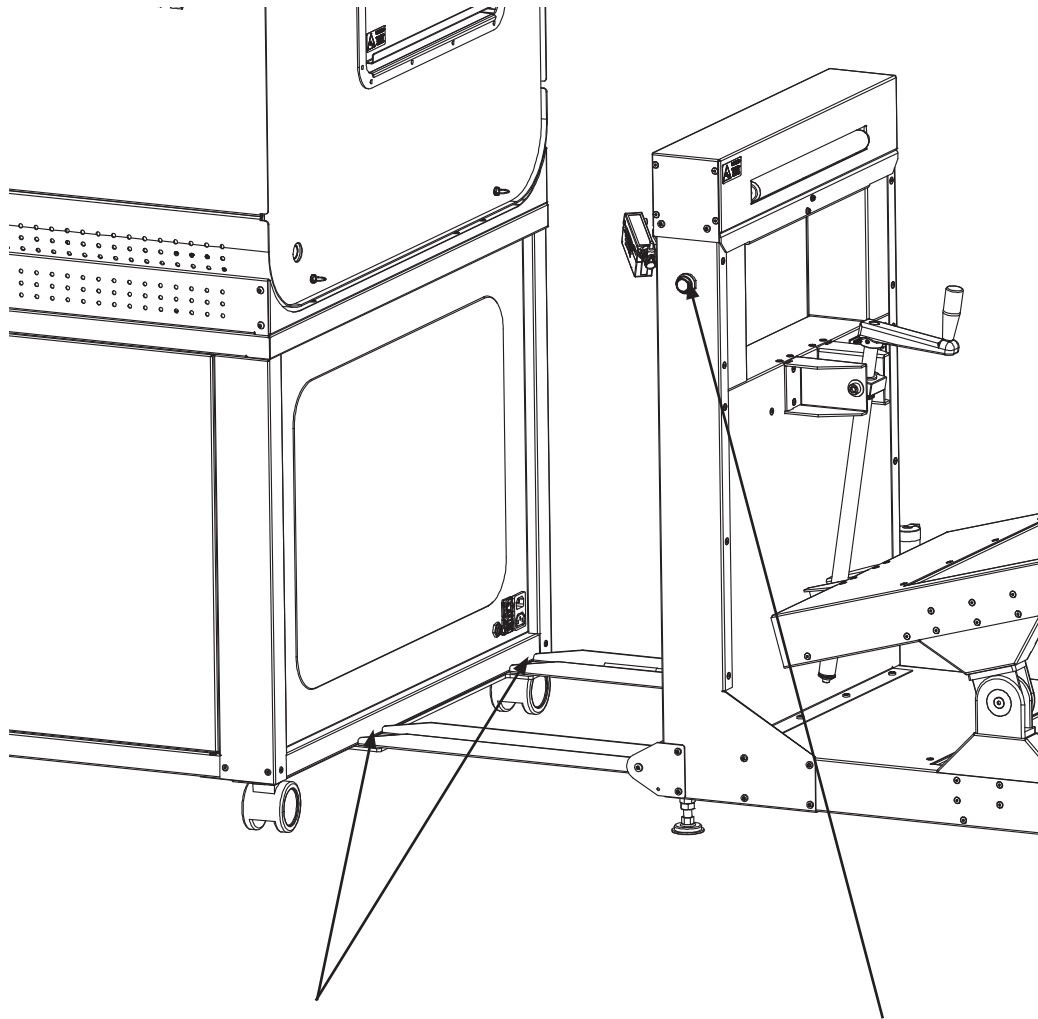
## 2.6 Place the units

To position the SF2 Unit and the Roll Unwinder correct in relation to the printer, there are guides on the SF Unit and RU that will help to hold the units in a fixed position. See figures below and on the next pages for how to place the units.



Fasten the SF Unit like this

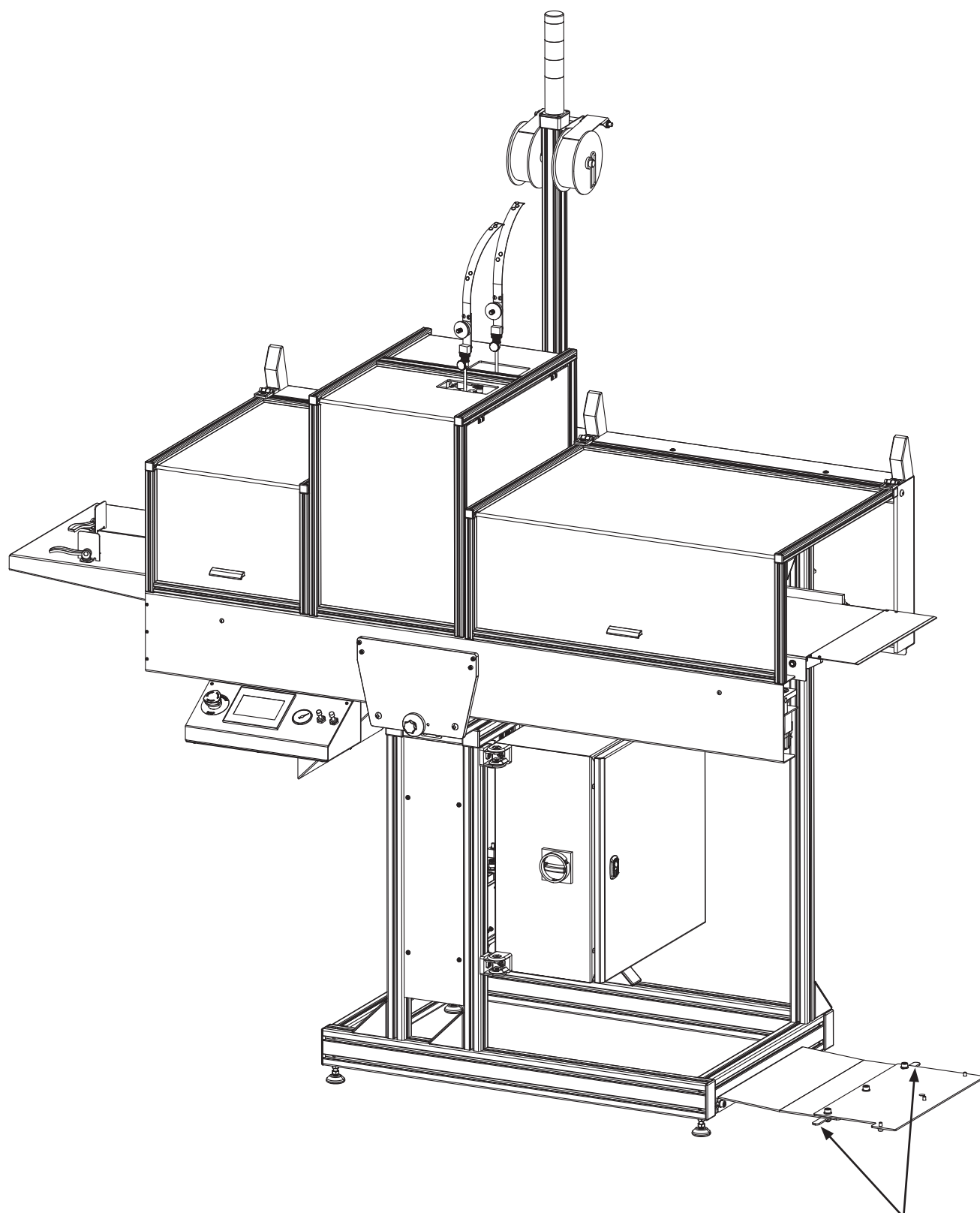




Place the Roll Unwinder so the guiding pins will fit into the holes in the plate on the printer

The Roll Unwinder power switch can be left on, as the printer will also control the power to the Roll Unwinder

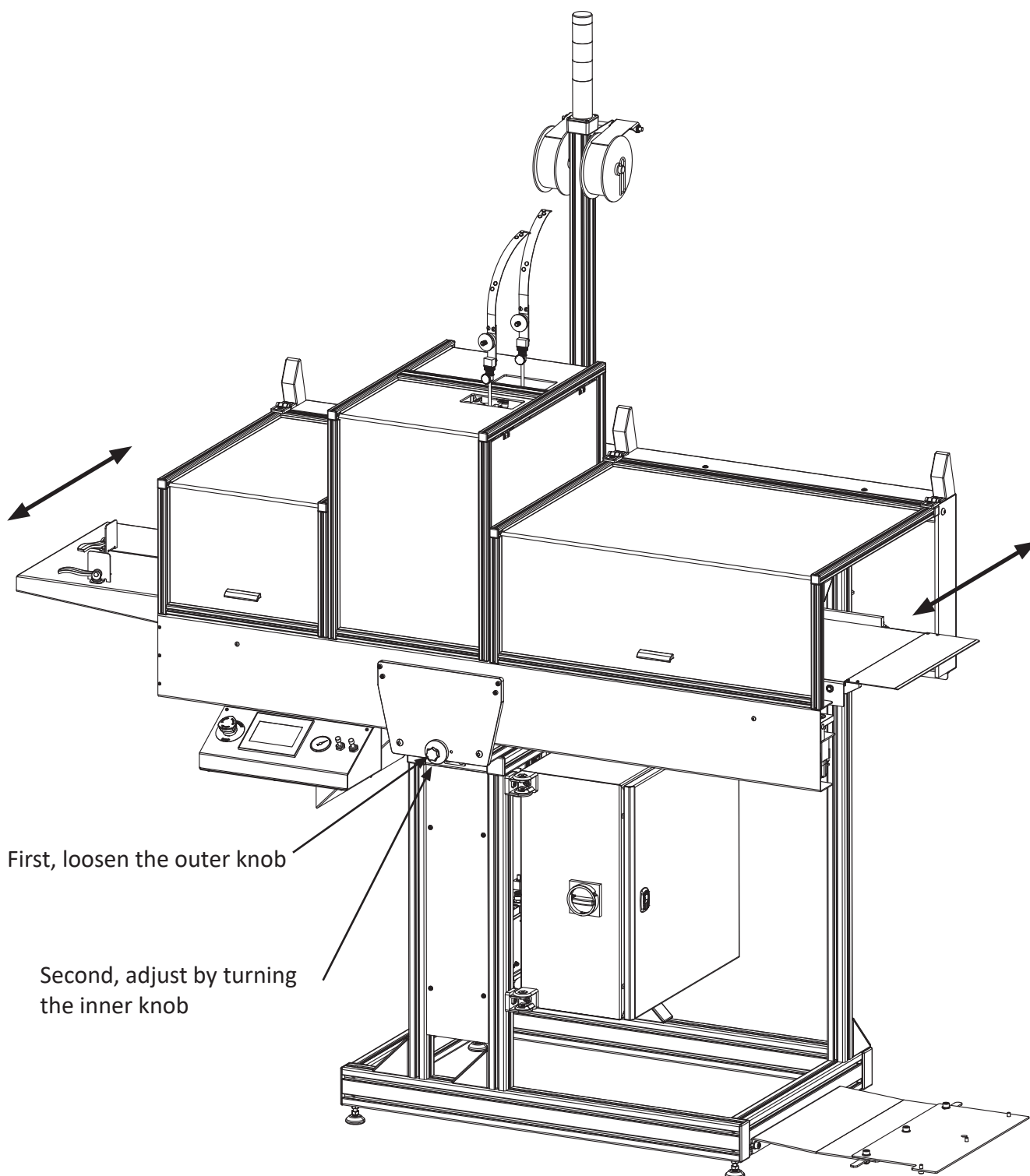
## 2.7 Adjusting the alignment between the SF2 Unit and the printer



Use these two handles to do fine adjustments to the aligning between the printer and the SF2 Unit

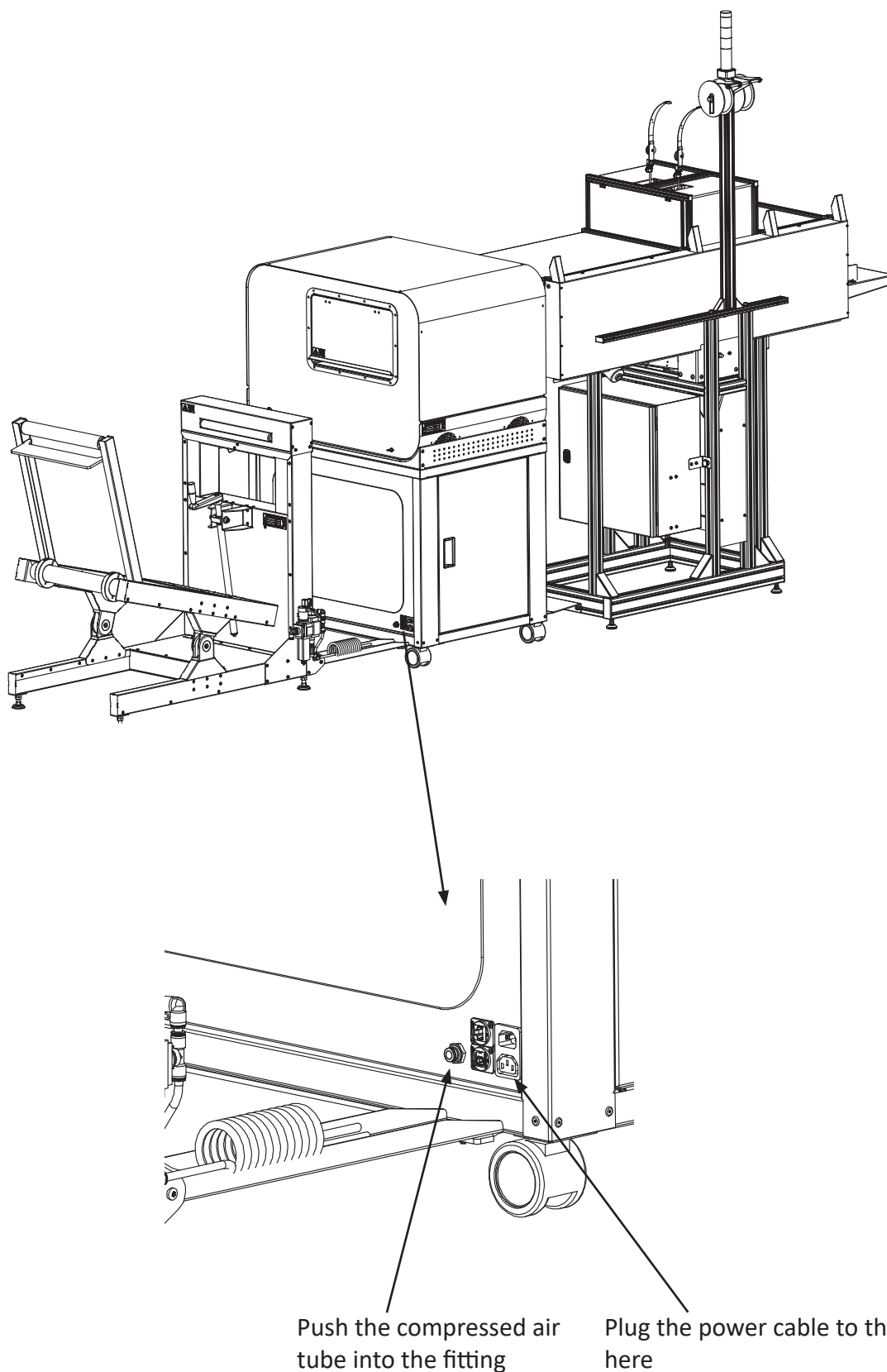
## 2.8 Adjusting the SF2 Unit sideways

It's possible to adjust the SF2 Unit a little back and forth sideways to align the paper edge with the paper guides.



## 2.9 Connect the units together

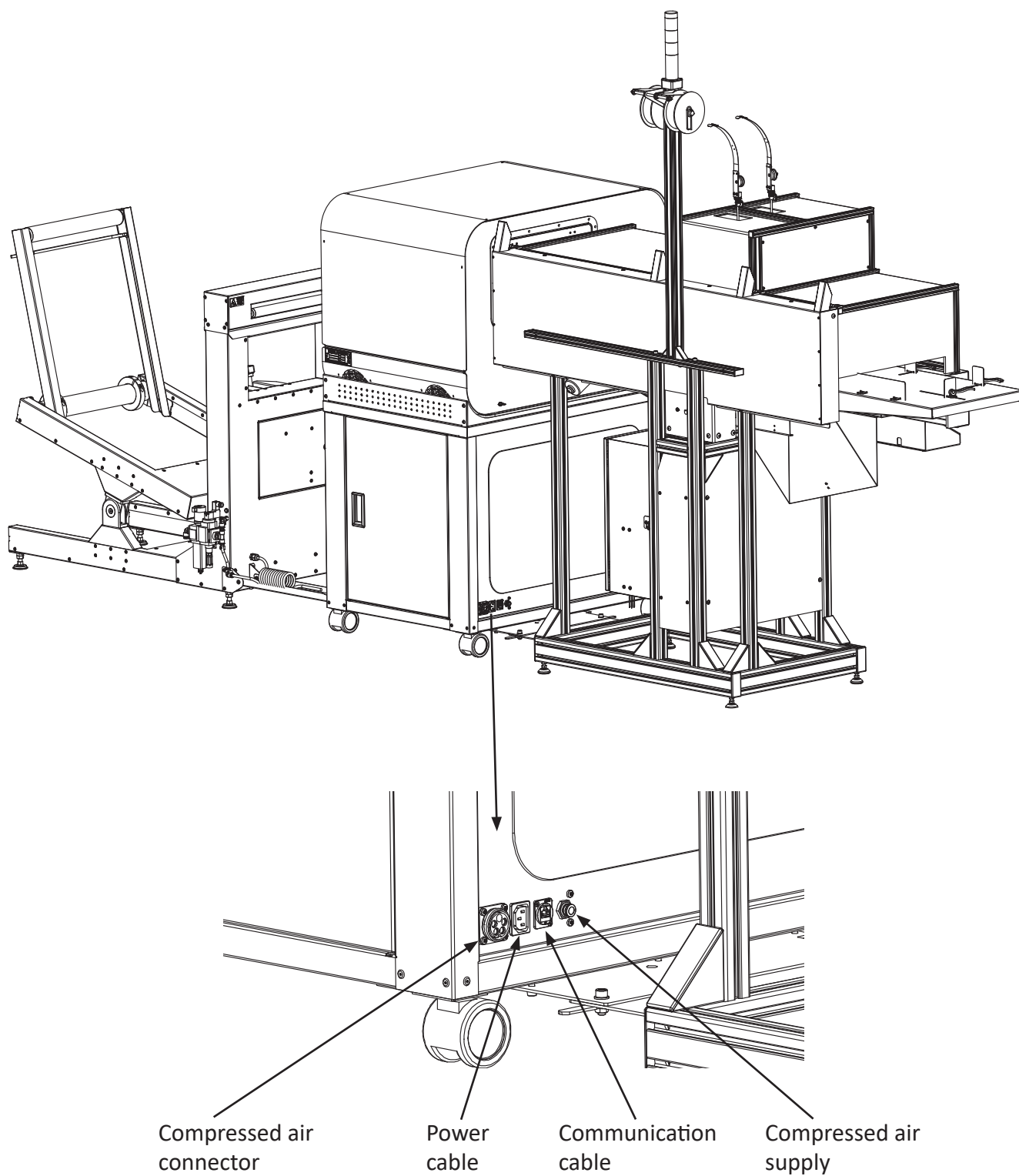
Plug the power cable from the RU into the corresponding outlet on the printer.  
Put the compressed air tube into the fitting on the printer.



On the SF2 Unit, plug in:

- Compressed air supply tube
- Communication cable
- Power cable
- Compressed air connector

And plug the mains cable for the SF2 Unit into a 230V outlet.



## 2.10 Connect the printer to the mains and computer

Plug the mains cable to the printer and RU into the inlet as shown in the figure below. Then plug the power cables for the printer/RU and SF2 Unit into your wall outlet.

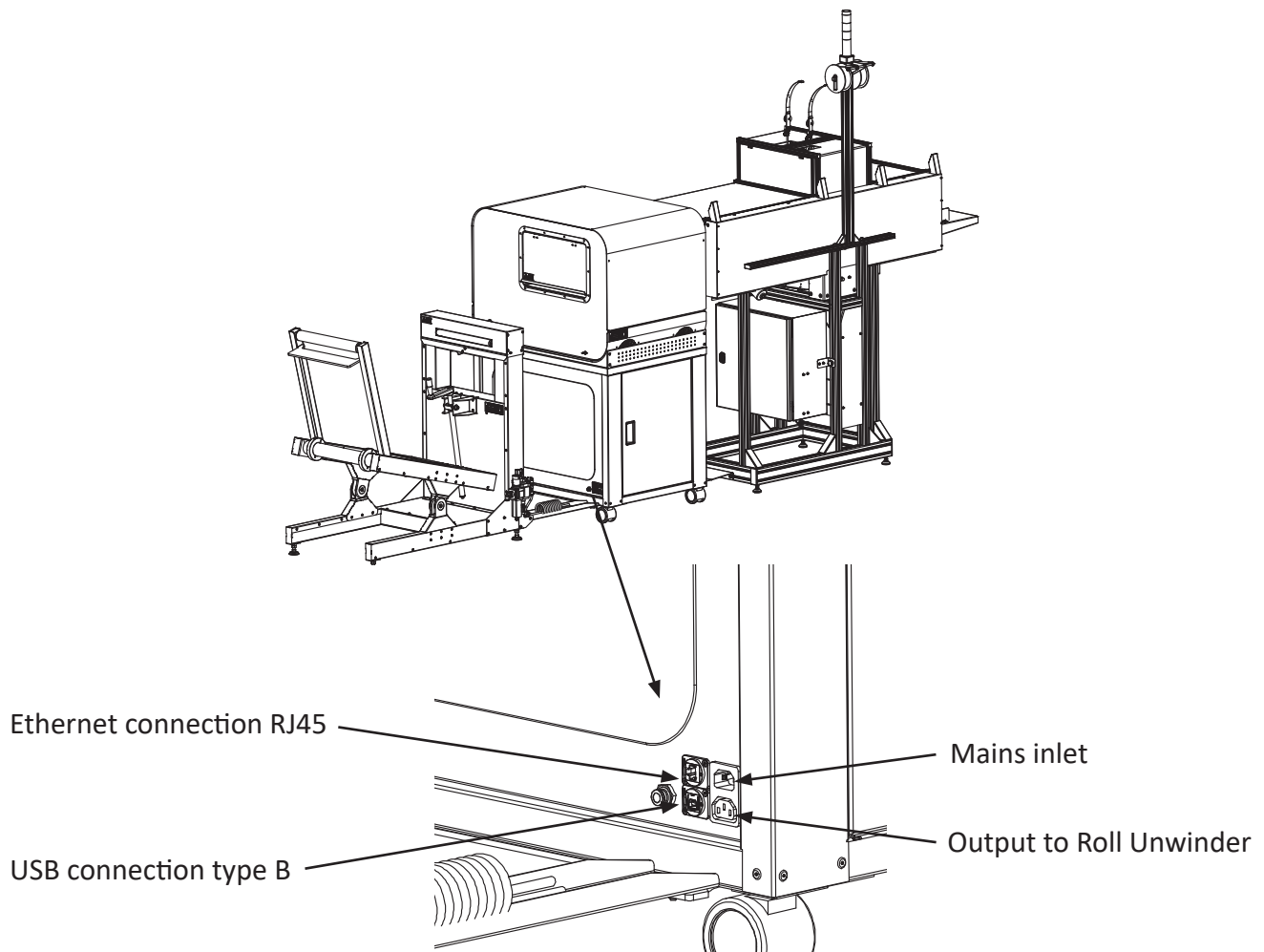
Connect the enclosed mains power cable to the Mains inlet. If you need to replace the connector on the mains cable, see section [2.11 'Secure the grounding' on page 27](#).

The connection to the computer can be done in three ways, either by Ethernet, USB, or WLAN.

For Ethernet and USB, the connections are placed on the side of the printer together with the power inlet. The ethernet input is a regular RJ45 connector, and the USB input is a regular USB type B connector. The WLAN is transmitting/receiving via a small antenna placed close to the operating panel.

If you connect to the computer with cable, there is no need to select between Ethernet or USB. The printer will connect to the input who receives data first. Meaning, if data comes on the ethernet, the USB will not be operative before the ethernet have finished the transmission.

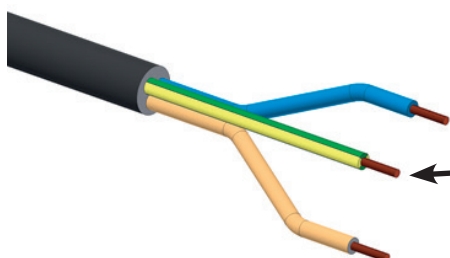
For instruction on how to install the printer on your computer, see chapter [3 'SETTING UP THE COMPUTER' on page 33](#).



## 2.11 Secure the grounding

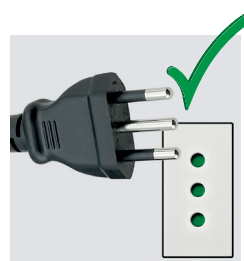
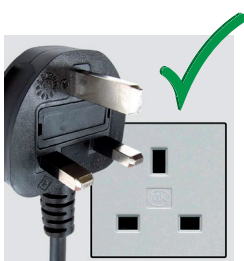
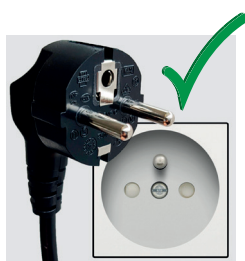
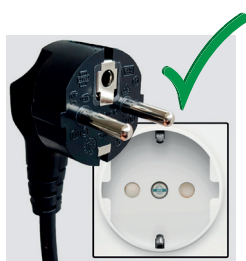
The printer's mains cable must always be connected to ground!

If the plug on the mains power cable is to be replaced with one that is compatible with the local electric contact points, observe that the yellow/green wire is the grounding (earthing) wire. Also make sure that you are connecting to 230 V  $\pm$  10%, 50/60 Hz.



If you are replacing the plug, make sure that the yellow and green wire are connected to Ground!

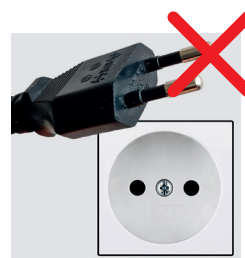
Examples of mains plugs and sockets with ground



These two socket types are ok to use with the enclosed cable.

With these and other types, you have to replace either the complete cable, or the plug on the enclosed cable.

Do not use mains plugs or sockets without ground!



## 2.12 Compressed air

This equipment requires clean, compressed air, minimum 7.0 bar @ 100 l/min., and max. temperature 50° C to the regulator to function. To make this compressed air, you will need to use some sort of compressor. No matter what kind of compressor is chosen, there are some important things to remember.



**First, please read the enclosed instruction manual for the compressor!**

There are many different compressor types on the market, and this chapter will not deal with a particular compressor, but will discuss the topic more in general. Please see the figure below for an example, but refer to your compressor manual for the specific information.

Normally a compressor have two pressure gauges and a pressure regulator fitted. The first gauge is measuring the tank pressure (before the regulator) and the second gauge is measuring the output pressure (after the regulator). The pressure at the compressor outlet must be adjusted to approx. 7 bar. This can be controlled at the output pressure gauge.

To have long and trouble free operation, the air must be filtered and free from oil and water. When air is compressed in a compressor, the air temperature is rising. So the air entering the tank will be hot. When the air is cooling down, the humidity in the air will condensate inside the tank. So the warmer and more humid the air entering the compressor is, the more water condensates inside the tank. The compressor is lubricated with oil and small amounts of oil may also get into the tank.



**This means that the tank must be drained for oil and water on a regular basis.**

If the air is supplied from the smaller types of compressors delivered from Braillo Norway AS, it's required to keep the compressor in a similar environment as described for the printer itself. (Temperature 15 - 30°C (60 - 86°F) and rel. humidity 40 - 60 %).

If the compressor is placed in a more harsh environment, it might be necessary to take further precautions to remove oil and water from the air.

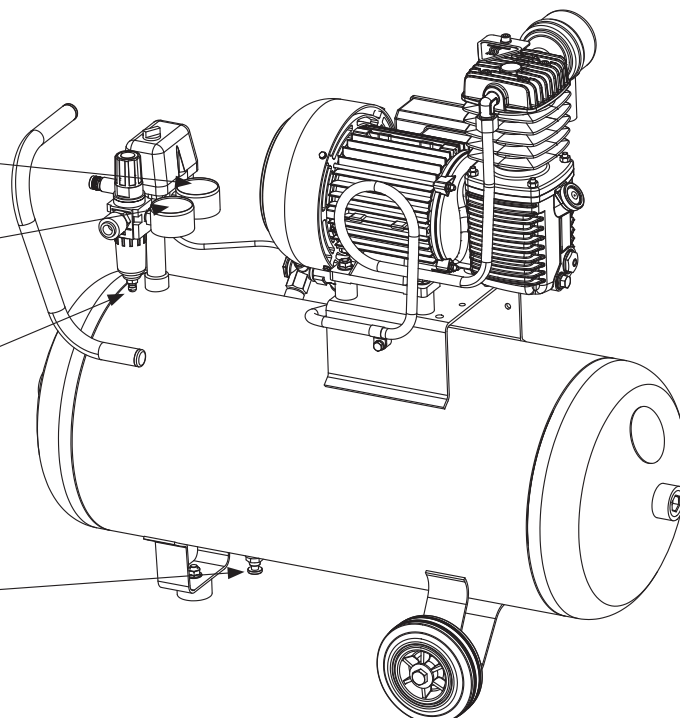
Basic elements on a compressor:

Tank pressure  
gauge

Output pressure gauge  
(adjust to 7 bar)

Filter drainage

Tank drainage





## Filtering and drainage

To stop oil and water from getting into the printer, there are filters and drainage units in the line. Some of these filters need to be drained, and some are automatically drained.

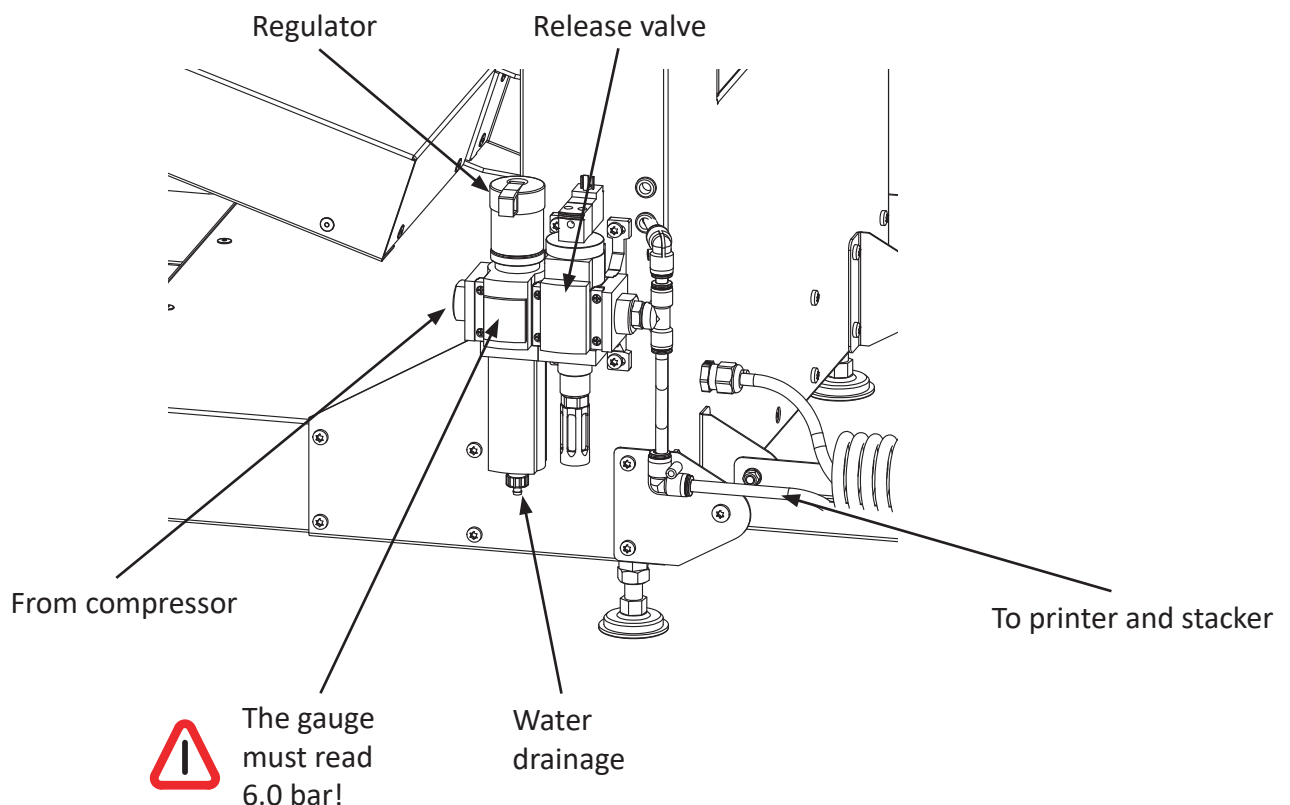
How often the manual draining has to be done depends on many things e.g. the temperature and humidity in the environment around the compressor and the workload on the compressor. The more the compressor runs, the hotter it will be and therefore it will produce more oil and water. So the best way is to learn from experience in the different situations.

There is an additional filter/drainage/regulator on the Roll Unwinder. This one has automatic drainage, so it will empty itself whenever it's something to drain.

When the compressor is starting, the tank pressure is zero (or very low). The pressure will then start to raise slowly. Because of this slow increase, the drainage valve might leak out the pressure. To solve this problem, a ball valve is fitted on the pipe nearby the compressor. This ball valve must be closed until the compressor has filled its tank. Then open the ball valve and the drainage valve will be closed.

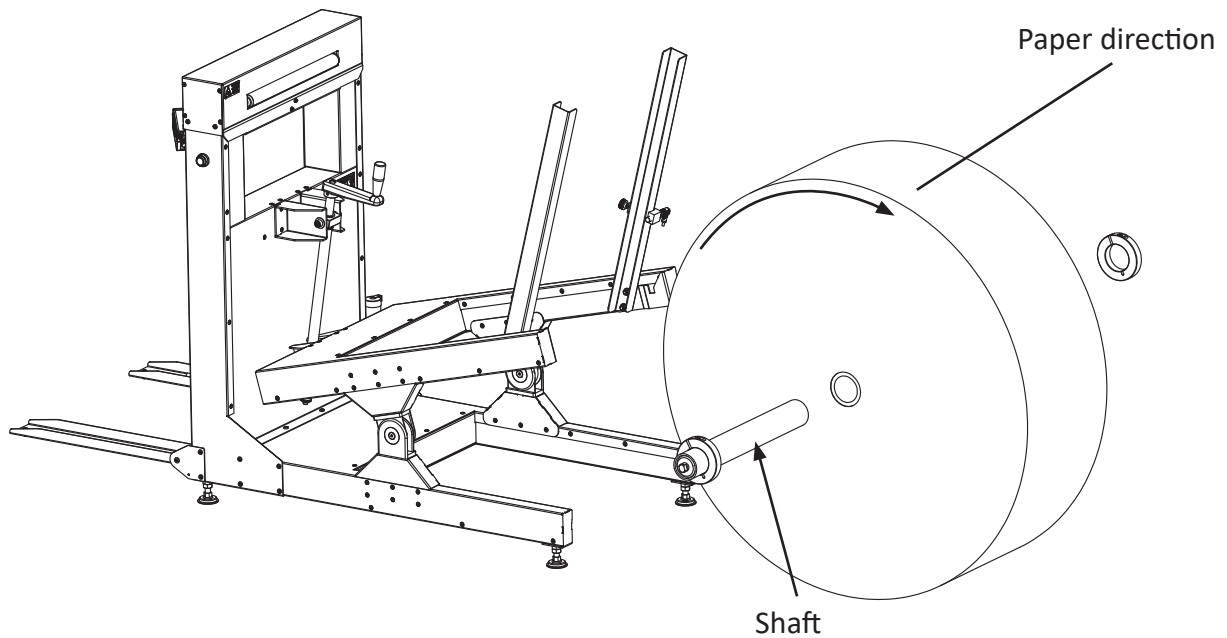
When the compressor is empty:

1. Close the ball valve.
2. Turn on the compressor.
3. Wait for the pressure to reach about 6 bar.
4. Open the ball valve.
5. Ready.



### 2.13 Place the paper roll

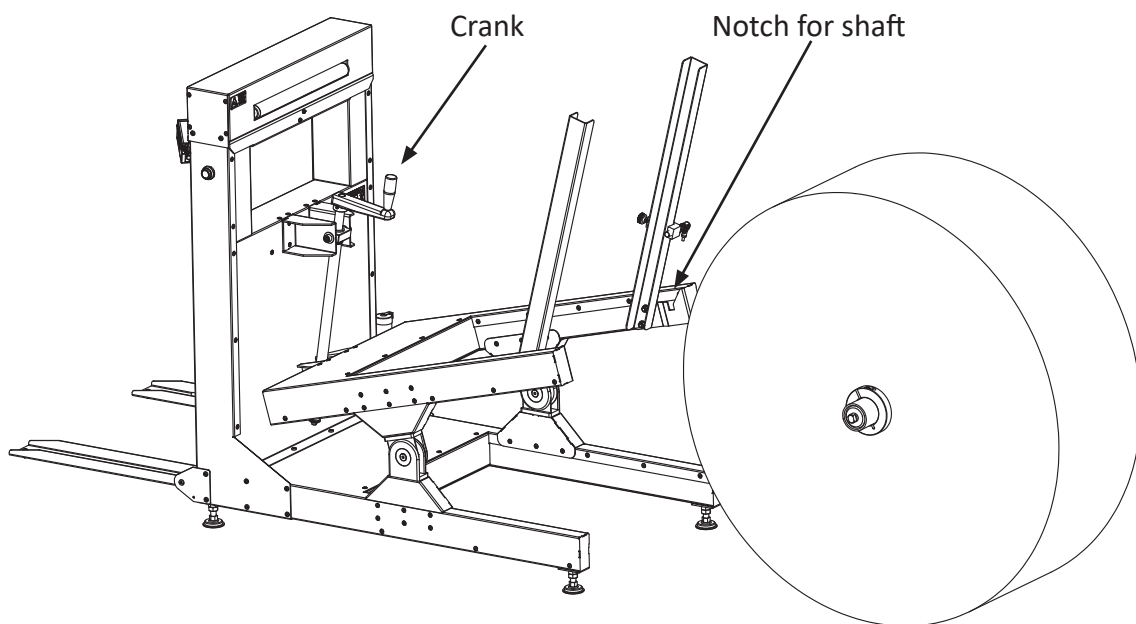
Put the shaft in the center of the roll, and ensure that the shaft is approximately in the centre side-ways. Fasten the shaft. The roll must be placed so the paper end is pointing away from the printer at the top of the roll. (See figure).



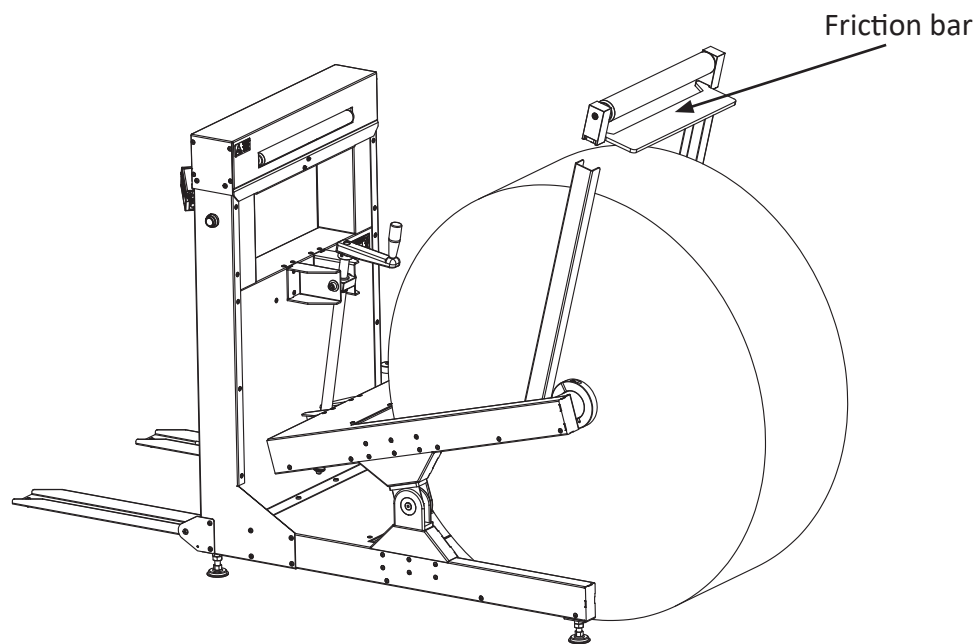
Use the crank to lower the two arms so it's lower than the shaft in the paper roll.

Then roll the paper roll carefully in between the two arms.

When the shaft ends are correctly aligned above the notches, use the crank to raise the arms and lift the paper roll off the floor.

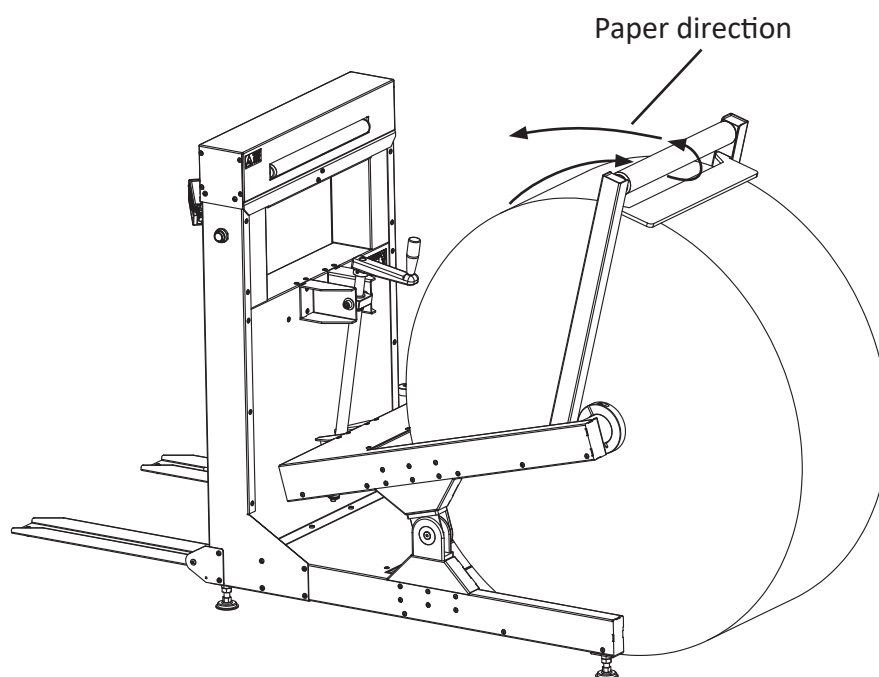


When the roll is lifted above the floor, place the friction bar between the guides, so it rests on top of the roll.



Thread the paper end in under the correction roll and then over it and towards the printer.

Remove and throw away the first rounds of paper on the paper roll to get rid of e.g. sand, dust and dirt after rolling the paper roll on the floor.



## 2.14 Power on

The On/Off switch is placed on the printer, behind the back panel and can be reached through an opening in the panel. When the mains cable has been connected, and the power has been switched on, the printer will do its start up sequence. The display will stay black for a moment, then it will show a progress bar for the start up sequence. When it's done, the display will show "Welcome, press the accept button to continue". Press the button and the display will change to "Ready to emboss".



For safety reasons, there are mechanical switches on the printer cover. These switches will disable the possibility to run the printer if the side plates are removed.

The paper feed unit will move a little back and forth to find the home position. If there is no paper inserted, the printer will start an alarm, and the display reads "Printer halted - Out of paper". This is normal, and the sound can be silenced by pressing the mute button.

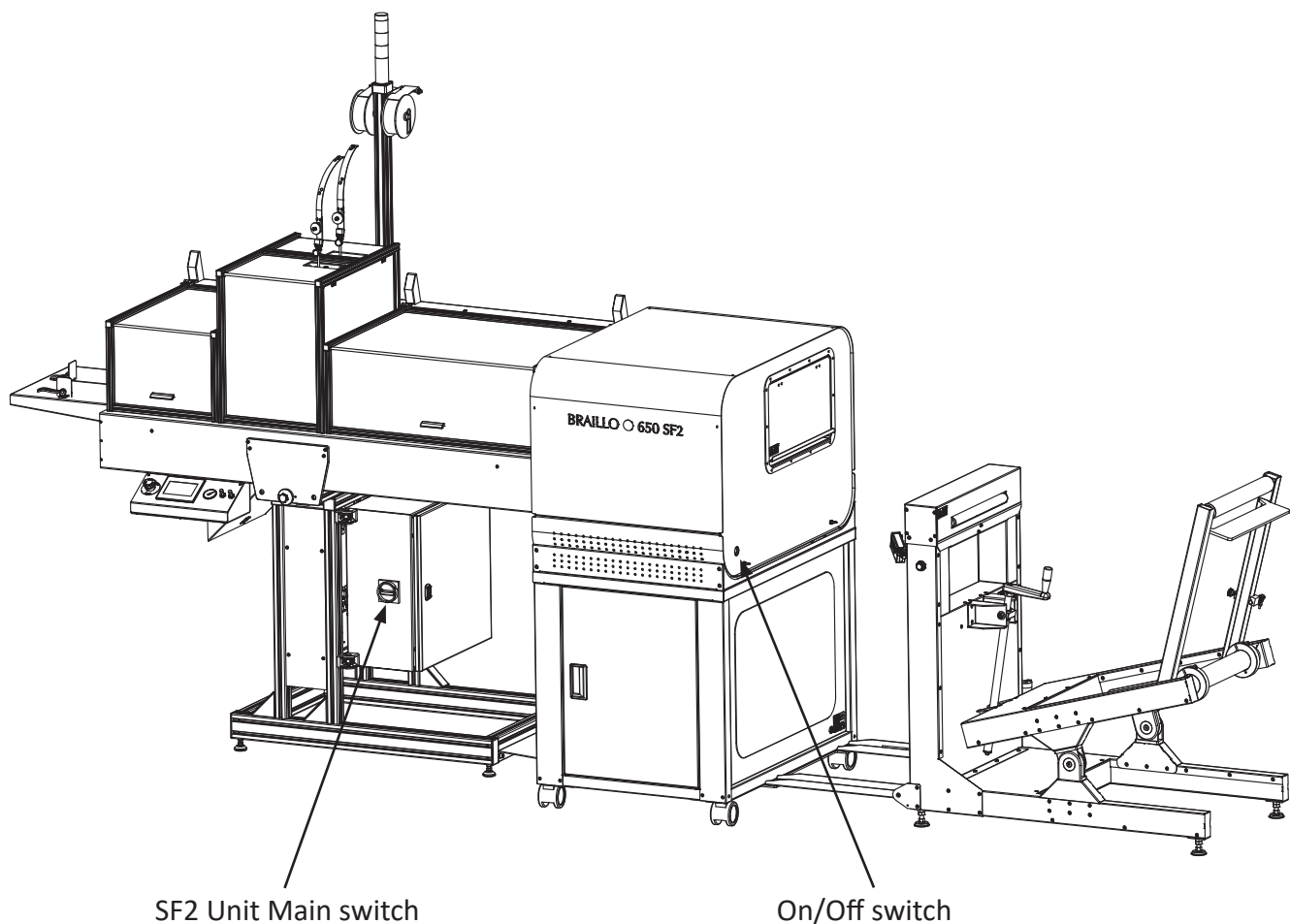
Note that the printer will go into sleep mode when it has been inactive for 15 minutes. If that happens, the printer will wake up if you touch the operating panel or send a file from the computer. It's also possible to manually put it in sleep mode by entering the main menu, and select the "Enter sleep mode" choice.

The printer is now ready. Before continuing, please read chapter 4 'OPERATING THE PRINTER' on page 44 carefully.



Note! There is crushing hazard on the SF2 Unit!

Turn off the SF2 Unit Main switch before assembling, maintenance, and repair!



### 3. SETTING UP THE COMPUTER

Note! When connecting multiple Braillo printers with USB to the same computer, all printers MUST have unique ID's configured.

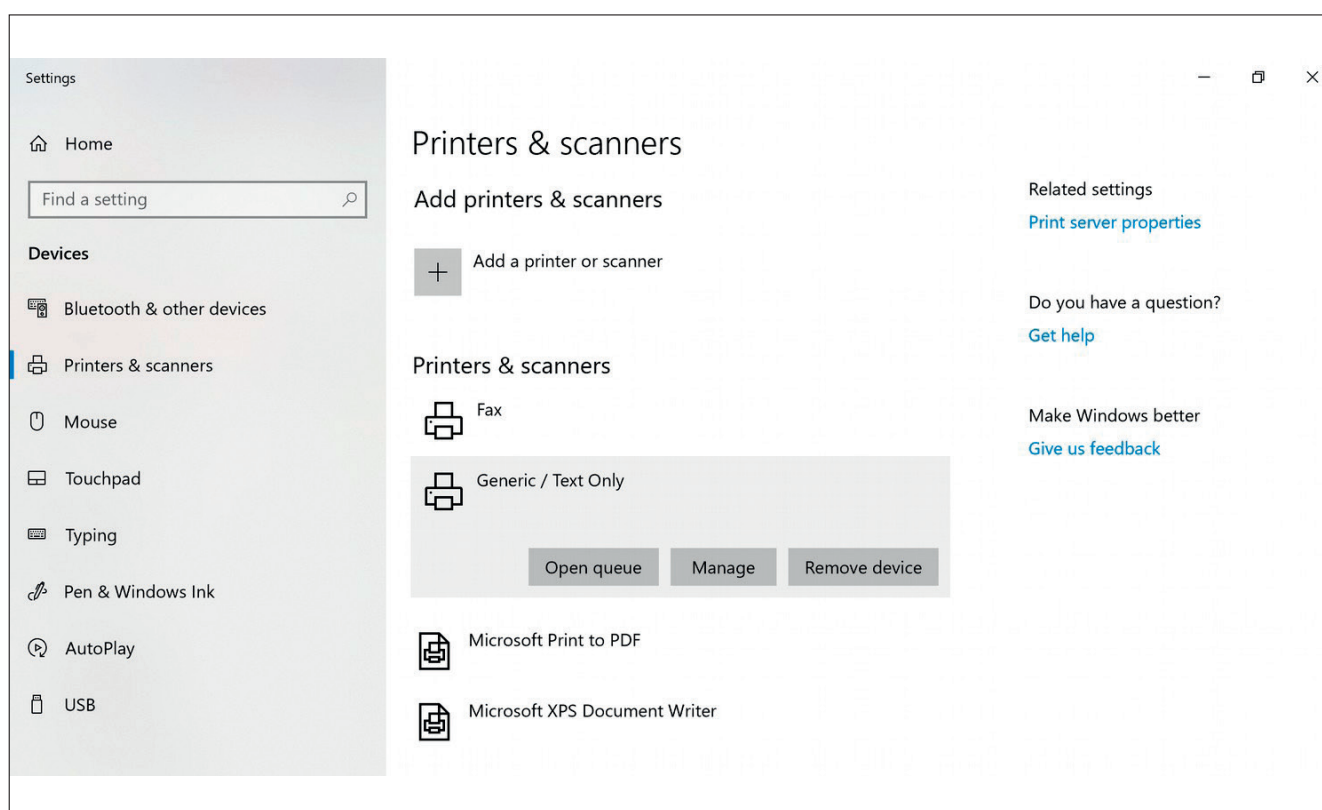
See '[Printer ID](#)' on [page 62](#) for more information on how to set the printer ID.

#### 3.1 USB on Windows

Make sure the printer is powered on and connected to the Windows computer via an USB device cable (Type A to Type B).

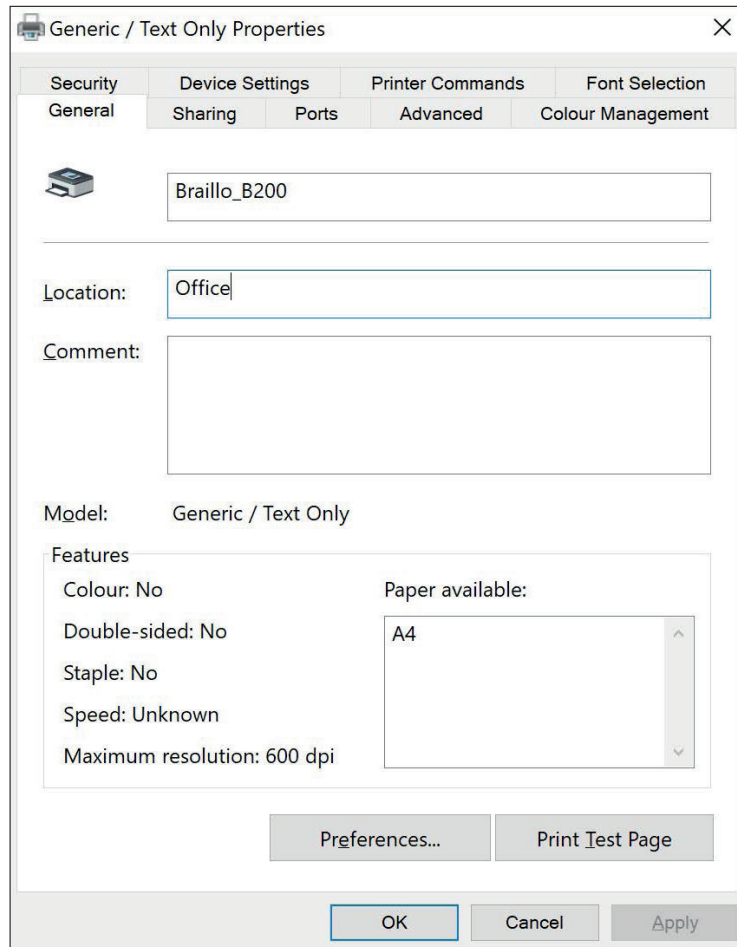
(Windows should automatically identify the printer and find the correct driver for it, but if it does not, you need to manually add the printer and find the 'Generic Text Only' printer driver.)

The printer then shows up as 'Generic / Text Only' like shown in the screen shot below.



Select it and click 'Manage', then 'Printer properties'.

Here you can change the printer Name and Location to your liking, for example 'Braillo <model number>'



Click 'OK' and your printer is now configured and ready to use.

### 3.2 USB on Apple Mac

Note! A Postscript Printer Driver (PPD) file is crucial in the following steps.

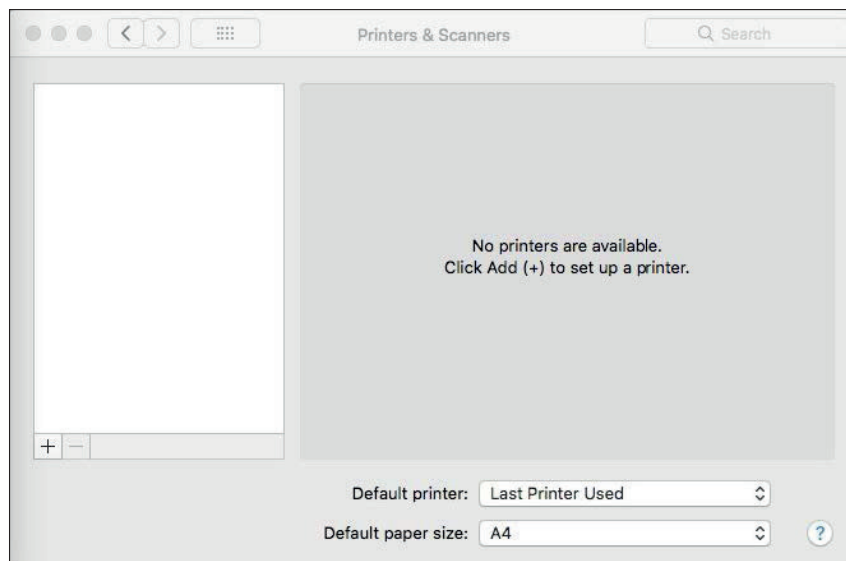
Without it, the local Apple computer will be unable to successfully communicate with the printer. The PPD file has been modified to work correctly with an Apple computer so any modifications to this file before set up might cause unexpected or erroneous results.

Contact Braillo Norway AS or your distributor to get the 'braillo.ppd' file.

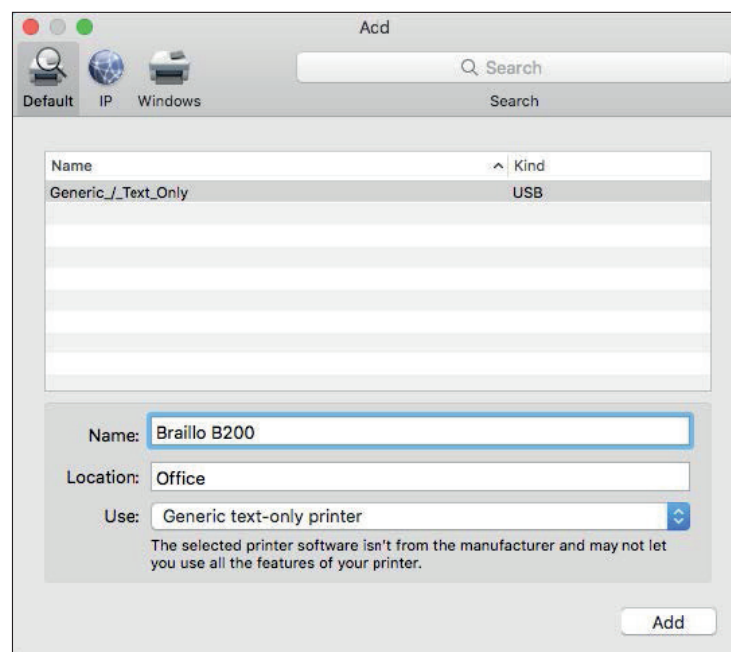
The PPD file must be copied onto the Apple machine prior to performing the printer setup!

Make sure the printer is powered on and connected to the Apple computer via an USB device cable (Type A to Type B).

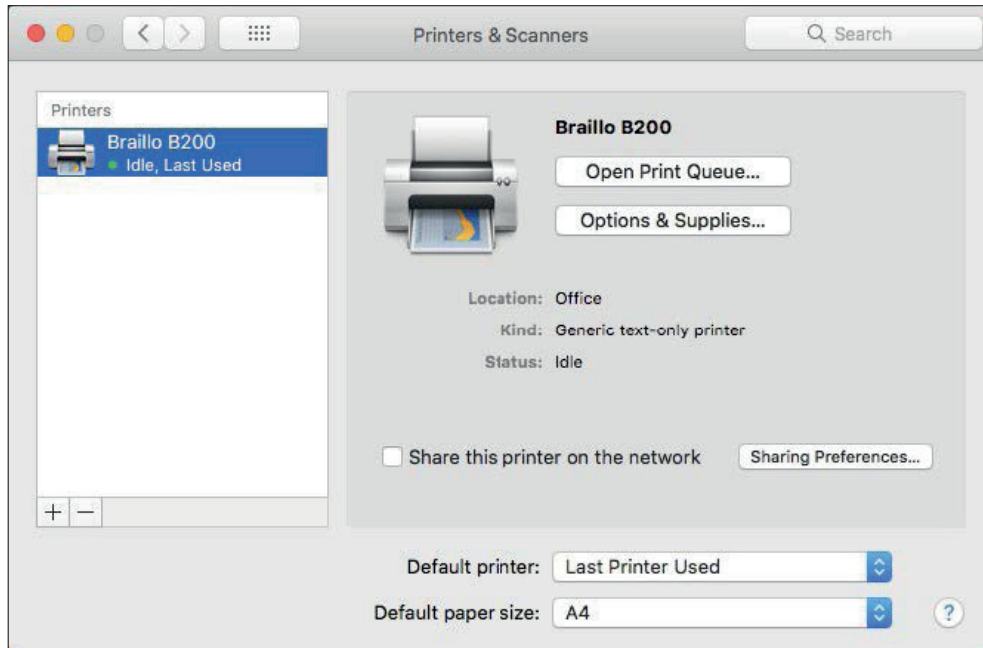
1. Open 'System Preferences'
2. Go to 'Printers & Scanners'



3. Click the plus sign (+) button to add new printer
4. In the new dialogue select the 'Generic\_/\_Text\_Only' USB printer (under Default tab)
5. The Mac OS will try to auto identify the printer, but will not succeed. This is expected.
6. In the 'Use' drop-down menu choose 'Other' and select the provided PPD file
7. Verify that the 'Use' field now says 'Generic text-only printer'
8. You can also modify the Name and Location fields to your liking, e.g. 'Braillo <model number>'
9. Click 'Add'



10. Your printer is now configured and ready to use

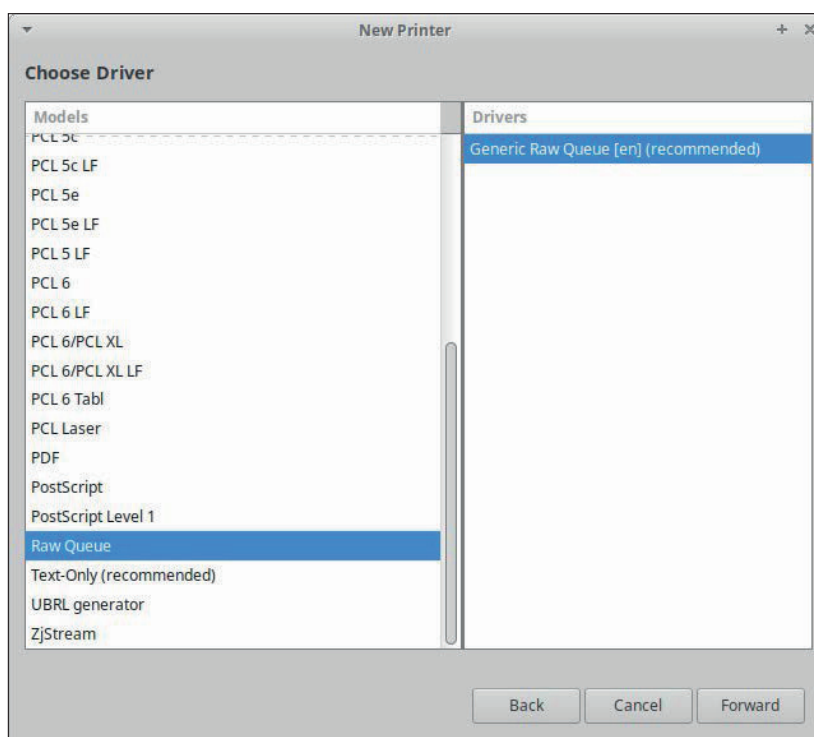


### 3.3 USB on Linux

Linux distributions can use one of many different graphical interfaces. Due to this the following guide is kept as generic as possible, and you might need to consult your distribution's help.

Make sure the printer is powered on and connected to the Linux computer via an USB device cable (Type A to Type B).

1. Find your distro's Control Panel and find the dialogue to add a printer
2. The printer should show up as USB printer named 'Generic/\_Text\_Only (<serial number>')
3. Select it and choose 'Generic' - 'Generic Raw Queue' as the printer driver





4. If you can choose any settings for the new printer, just leave everything as default
5. Give the printer a identifiable Name and Location, for example 'Braillo\_<model number>'
6. Your new printer is now configured and ready to use

Note! If you use the default 'Generic Text-only printer' driver for USB printing on Linux you might run into issues where the driver will strip certain control characters and just print the text. It could also refuse to print certain documents which contain more than just printable text characters. Also make note that this driver will add margins around the text by default, which might interfere with the document formatting. The recommended driver on Linux is 'Generic Raw Queue' or similar raw forwarding driver.

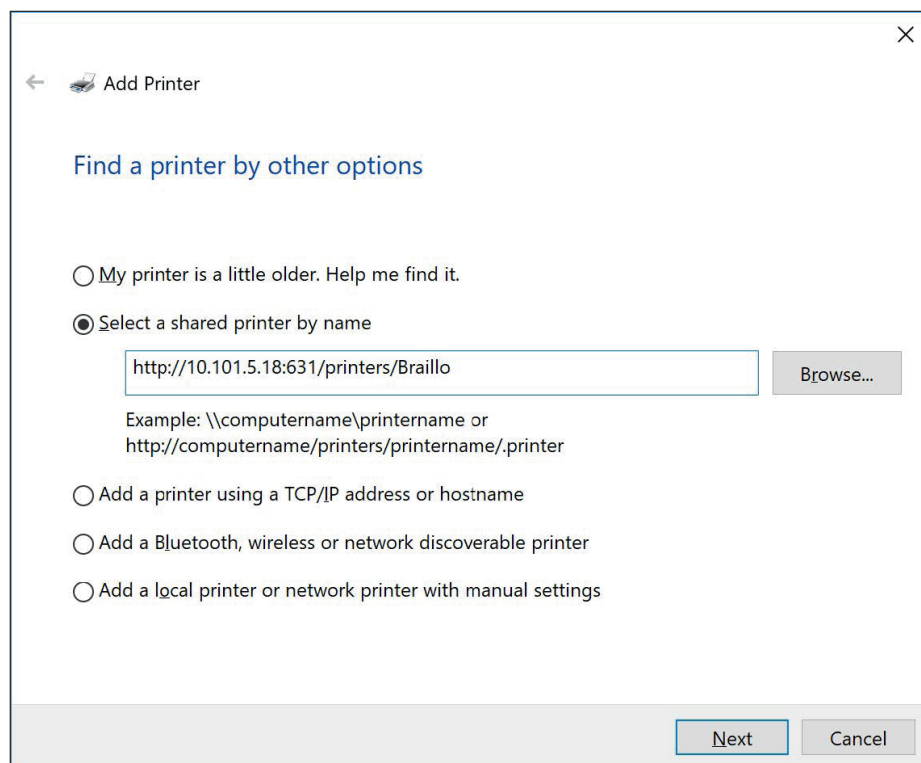
### 3.4 Ethernet on Windows

Before starting, make sure the printer is powered on and connected to the network.

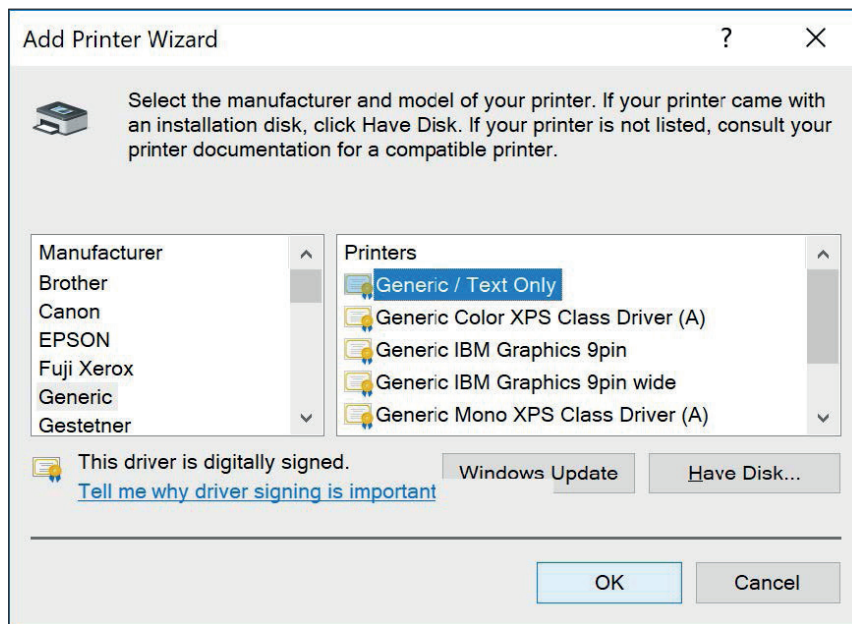
You will need the printer's IP address which can be found in menu *Main Menu - Warning - Service/diagnostic - Status / Software upgrade*.

See '[Status / Software upgrade](#)' on [page 60](#) for more information.

1. Open 'Printers & Scanners' settings. (Via the Windows menu or via Settings - Devices)
2. Click 'Add a printer or scanner'
3. After Windows has scanned, click 'The printer that I want is not listed'
4. In the 'Add Printer' dialogue select 'Select a shared printer by name'
5. Enter the following in the field: `http://<IP-address>:631/printers/Braillo`



6. Click 'Next'
7. In the driver selection dialogue select 'Generic' and 'Generic / Text Only'



8. Click 'OK'
9. Click 'Next' and 'Finish' to close the dialogue
10. Your printer is now configured and ready to use

Note! If you print a file with Notepad or another text editor, chances are high that the editor will try to format the text before sending it to the printer. If you have a preformatted file created for the Braillo printer containing control characters, it might not end up printing like it should. To print a file verbatim on Windows, you could share the printer in the Windows network ('Sharing' under printer properties), and use the following command in a Command-line prompt:  
`copy /b <filename.txt> \\<Name-of-computer>\<name-of-shared-printer>`

### 3.5 Ethernet on Apple Mac

Note! A Postscript Printer Driver (PPD) file is crucial in the following steps.

Without it, the local Apple computer will be unable to successfully communicate with the printer. The PPD file has been modified to work correctly with an Apple computer so any modifications to this file before set up might cause unexpected or erroneous results.

Contact Braillo Norway AS or your distributor to get the 'braillo.ppd' file.

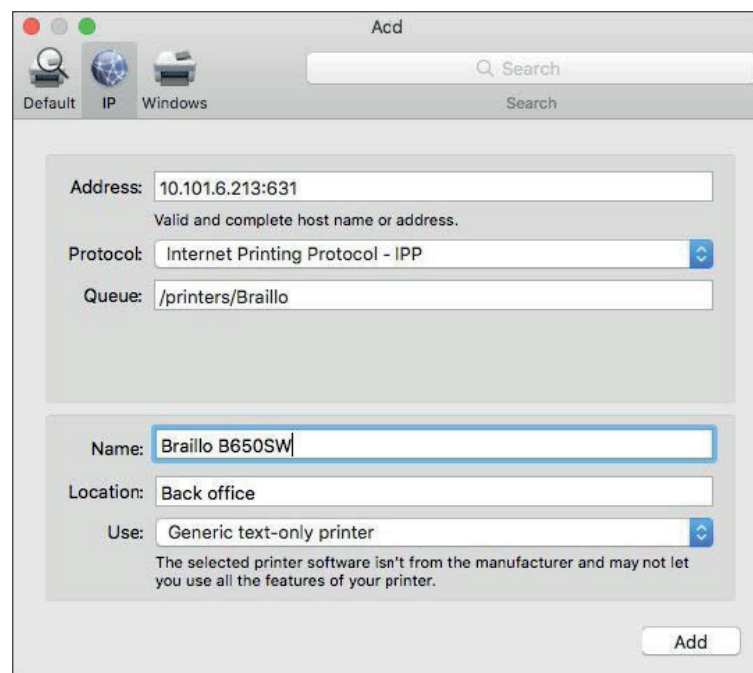
The PPD file must be copied onto the Apple machine prior to performing the printer setup!

Before starting, make sure the printer is powered on and connected to the network.

You will need the printer's IP address which can be found in menu *Main Menu - Warning - Service/diagnostic - Status / Software upgrade*.

See '[Status / Software upgrade](#)' on page 60 for more information.

1. Open 'System Preferences'
2. Go to 'Printers & Scanners'
3. Click the plus sign (+) button to add new printer
4. In the new dialogue click the 'IP' tab
5. Fill in:  
Address: '<IP-address>:631'  
Protocol: IPP  
Queue: '/printers/Braillo'
6. In the 'Use' drop-down menu choose 'Other' and select the provided PPD file
7. Verify that the 'Use' field now says 'Generic text-only printer'  
You can also modify the Name and Location fields to your liking,  
for example 'Braillo <model number>'



8. Click 'Add'
9. Your printer is now configured and ready to use

If you want to configure the network printing another way the full connection string is:  
ipp://<IP-address>:631/printers/Braillo

### Test the communication

To test if the Apple machine is successfully communicating with the Braillo printer, you first need the exact name of the Braillo printer, it can be found by using 'lpstat -t'.

Next, create or select a file that can be used for printing. Open a Terminal and use the 'lpr' command to send the file to the printer, like this:

```
lpr -P <Braillo_Name> <file_to_print>
```

In this command, -P means destination or which printer to use. <Braillo\_Name> is the exact name of the Braillo printer identified above, and <file\_to\_print> is the file to be printed, with path relative to the Terminal current directory.

## 3.6 Ethernet on Linux

Before starting, make sure the printer is powered on and connected to the network.

You will need the printer's IP address which can be found in menu *Main Menu - Warning - Service/diagnostic - Status / Software upgrade*.

See '[Status / Software upgrade](#)' on [page 60](#) for more information.

The printer broadcasts itself using dnssd/bonjour. If you only have one Braillo printer on your network you can use this if your computer detects it. If you have multiple Braillo printers it's better to add them by their IP address to be sure you are configuring the correct one.

1. Find your distro's Control Panel and find the dialogue to add a printer
2. Select 'Internet Printing Protocol (ipp)'
3. Use the network URI: 'ipp://<IP-address>:631/printers/Braillo'
4. Give the printer a identifiable Name and Location, for example 'Braillo\_<model number>'
5. Your printer is now configured and ready to use

### Test the communication

To test if the Linux computer is successfully communicating with the Braillo printer, the 'lpr' command can be used. Create or select a file that can be used for printing and enter the following command in a terminal: `lpr -P <Braillo_Name> <file_to_print>`

Where -P means destination, <Braillo\_Name> being that destination name, and <file\_to\_print> being a text file or file that is compatible with the Braillo printer.

The exact device name of the Braillo printer can be found by using 'lpstat -t'.

### 3.7 Wireless network (WLAN)

The configuring of the wireless network connection is handled through a special configuration mode where the printer creates a temporary Access Point. When connected to this AP the rest of the configuration is handled through a standard web page.

To enter the WLAN configuration mode, navigate to:

*Main Menu - Printer setup - Network configuration - Conf. WLAN.*

See section '[Wireless configuration](#)' on page 64 for more information.

A screen now shows up with the credentials needed to log on to the temporary configuration access point. The network name (SSID) is unique for this printer, but the password is generated and will differ every time you start configuration mode.

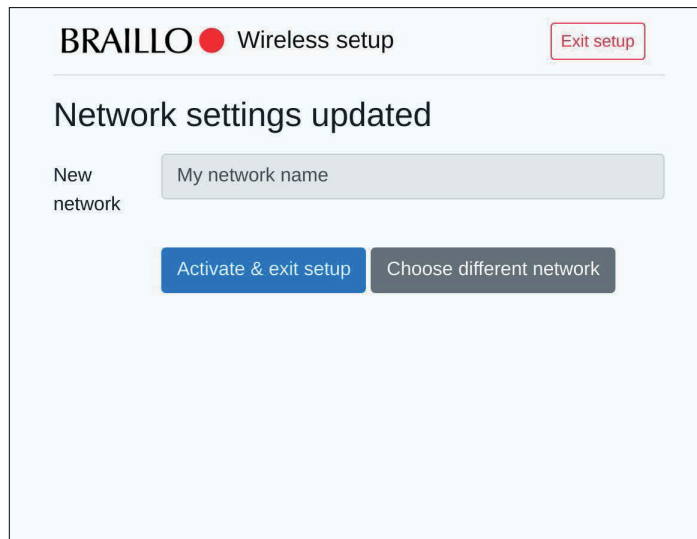
Leave the printer in this state while you continue the configuration.

Using a laptop, tablet, smart phone or other Wireless enabled unit with a web browser:

1. Connect to the temporary Access Point using the credentials in the printer display
2. Open a web browser and navigate to <http://192.168.45.1/>  
Some devices will detect the need to 'sign-in' or 'authorization needed'. Clicking this notification will lead you to the same web page.

The screenshot shows the 'BRAILLO Wireless setup' web interface. At the top, there is a header with the BRAILLO logo and the text 'Wireless setup', and an 'Exit setup' button. Below the header, the main heading is 'Configure network settings'. There are three tabs: 'Select network' (which is active), 'Manual setup', and 'Forget network'. Under the 'Select network' tab, there is a section titled 'Wireless network' containing a dropdown menu with 'Choose...' and a 'Refresh' button. Below this is a 'Password' section with a text input field and a 'Show password' checkbox. At the bottom, there is a blue 'Save network' button.

3. In the 'Wireless network' drop-down menu, select the name of the wireless network to use
4. Enter the password in the 'Password' field
5. Click the 'Save network' button

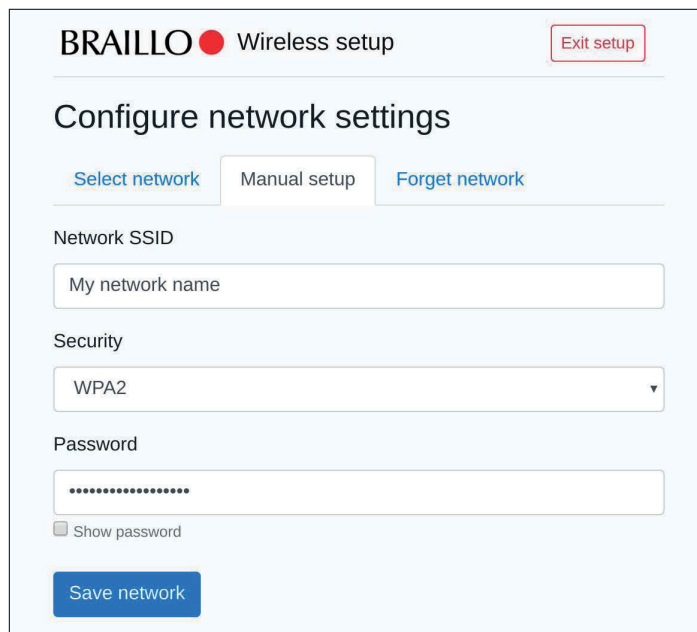


The screenshot shows the 'BRAILLO ● Wireless setup' interface. At the top right is an 'Exit setup' button. The main heading is 'Network settings updated'. Below this, there is a 'New network' label and a text input field containing 'My network name'. At the bottom, there are two buttons: 'Activate & exit setup' (blue) and 'Choose different network' (grey).

6. Click the 'Activate & exit setup' button

**If your wireless network is not discovered by the printer you can also configure it manually:**

1. Follow step 1 and 2 above
2. Click the 'Manual setup' tab
3. Enter the SSID, choose security and enter the password (if needed)



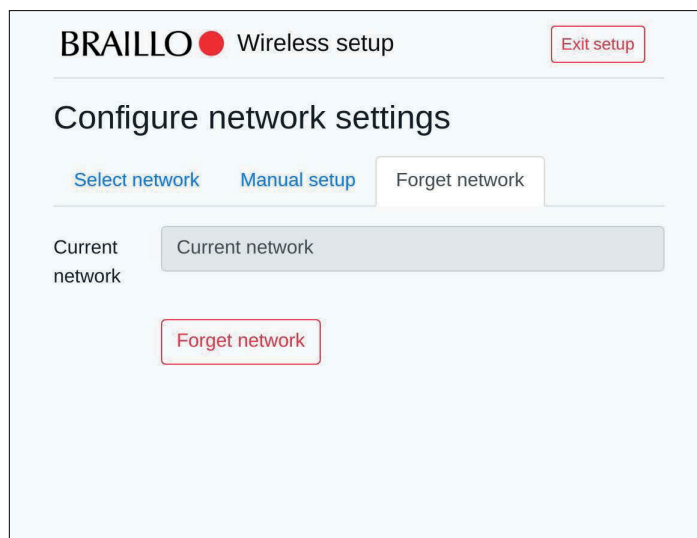
The screenshot shows the 'BRAILLO ● Wireless setup' interface with the 'Configure network settings' section active. At the top right is an 'Exit setup' button. Below the heading, there are three tabs: 'Select network' (blue), 'Manual setup' (active), and 'Forget network' (blue). The 'Manual setup' tab contains the following fields:

- 'Network SSID' with a text input field containing 'My network name'.
- 'Security' with a dropdown menu showing 'WPA2'.
- 'Password' with a text input field containing masked characters (dots).
- A checkbox labeled 'Show password'.
- A blue 'Save network' button at the bottom.

4. Click the 'Save network' button
5. Click 'Activate & exit setup' button

**To remove an already configured wireless network without activating a new:**

1. Follow step 1 and 2 in the start of this section
2. Click the 'Forget network' tab



3. Click the 'Forget network' button
4. Click the 'Activate & exit setup' button

After clicking the 'Activate & exit setup' button, you will get a confirmation message and the configuration mode shuts down and the printer returns to normal with the new configuration.

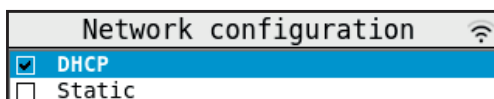
**To exit the WLAN configuration mode:**

To exit configuration mode you need to either:

- Save and activate a new configuration
- Click the 'Exit setup' button on configuration web page
- Click the 'Back' button in the printer display

When the configuration server shuts down the printer returns to normal operation.

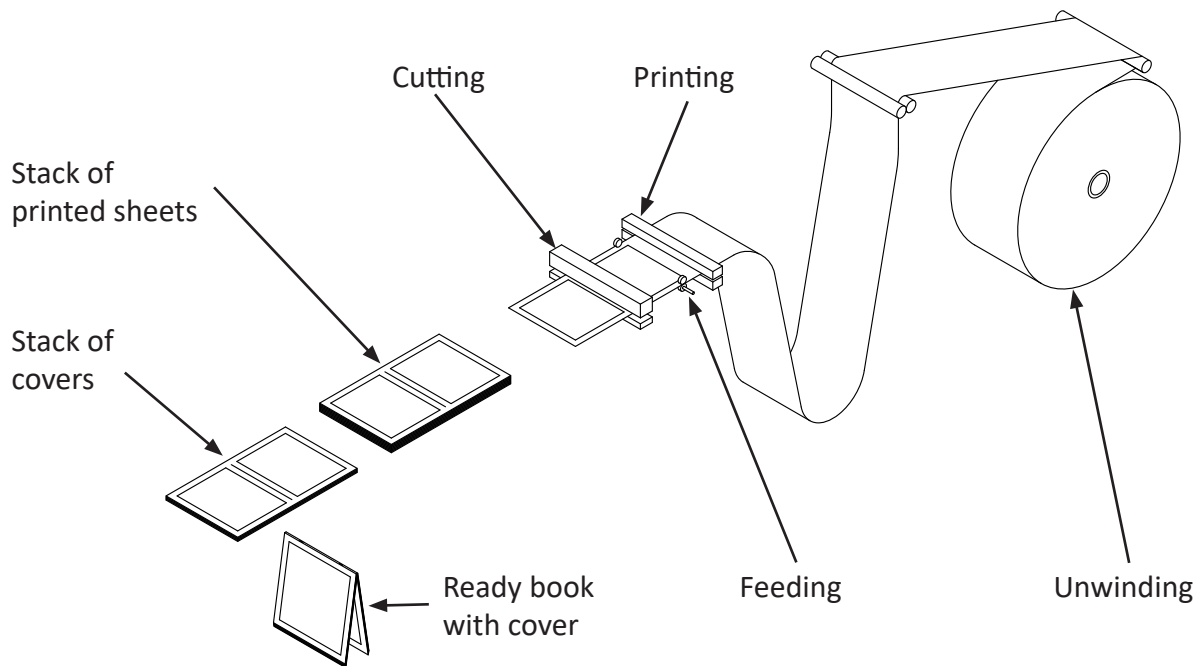
If a new wireless configuration was activated you can see the connection status and signal strength in the top right corner of the printer display.



**Note!** If the printer behaves unexpectedly after being in Wireless network configuration mode, please try restarting the printer.

## 4. OPERATING THE PRINTER

The figure below is a schematic drawing on how the paper travels through the machine.



### 4.1 Adjust to paper width

All these adjustments are dependent on the paper roll width, so it can be wise to use a paper sample from the roll to set the width.

It's recommended to start with the paper feeder unit nearest to the main belt (the right-hand one when looking in the direction the paper travels), because this will also determine the top margin on the sheet.

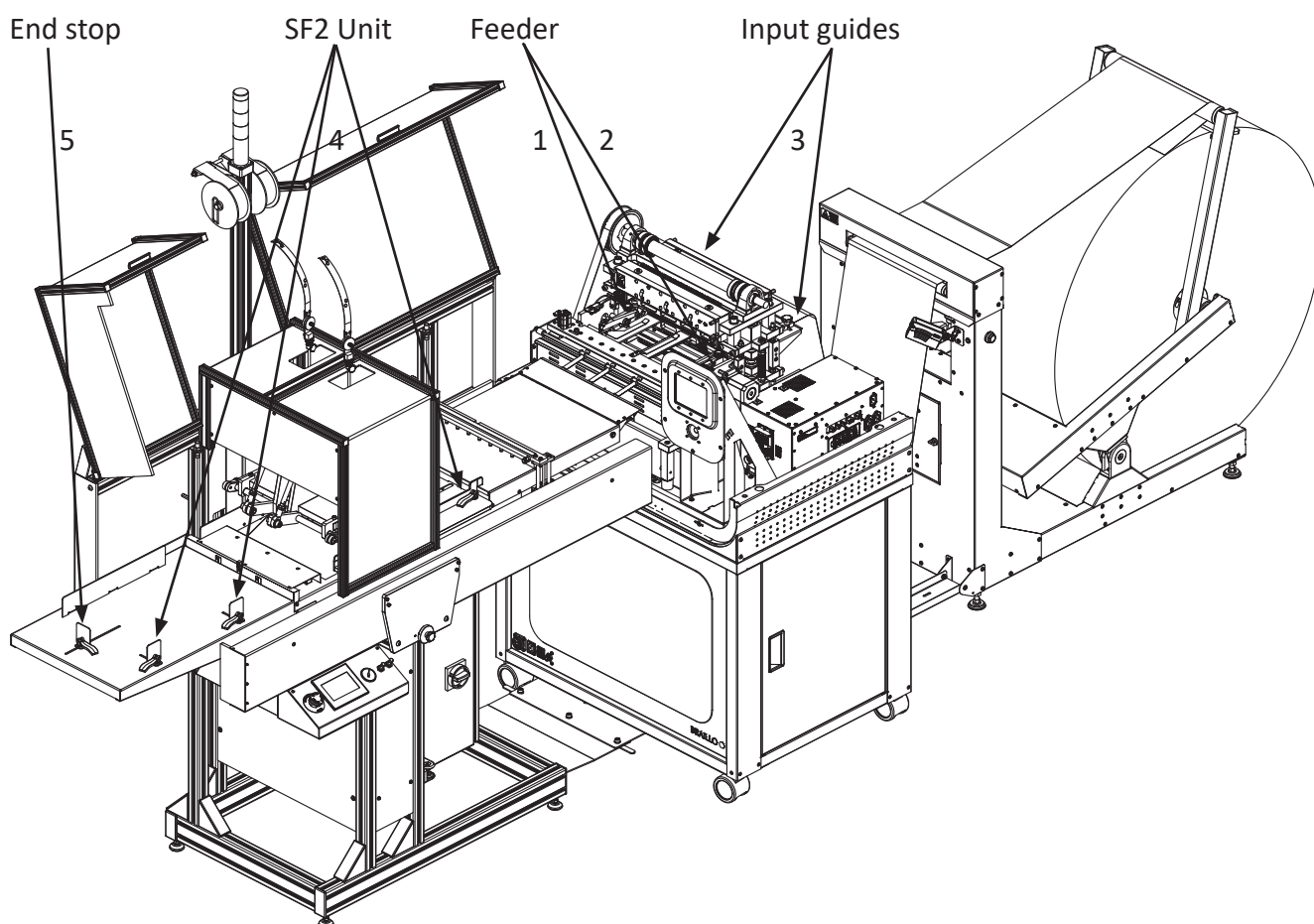
The adjustment should be done in this order:

1. Move the feeder unit nearest to the main belt to the desired position (note the top margin).
2. Adjust the other feeder unit so the distance between them is equal to the paper width.
3. Put the paper into the printer, and align the guides on the input tray.
4. Adjust the width on the guides on the SF2 Unit.
5. Adjust the end stop for the cover magazine.

See figures on the following pages.



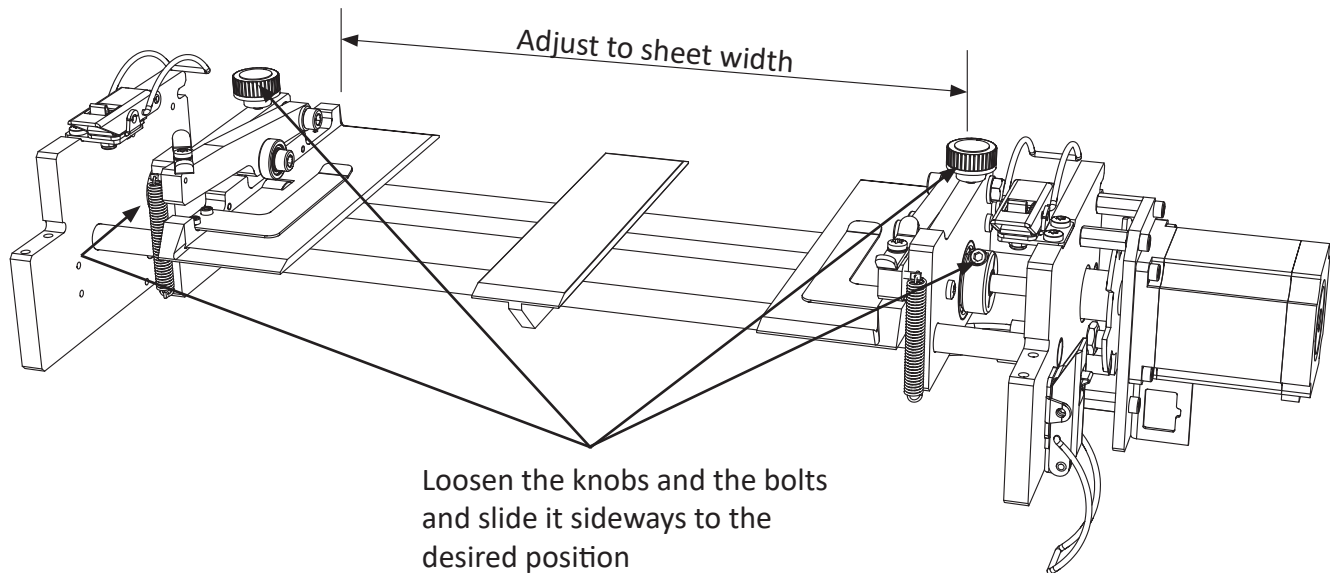
The numbers are indicating in which order the adjustments should be done.  
(The printer cover and the protection covers are removed in the figure to get a better view, but this adjustments can be done with the covers on).



### **Paper feeder, adjust width**

Loosen the knobs and the bolts (without taking the knobs or bolts out).

The two feeder units can now be moved sideways. Note that the unit on the side nearest to the main belt will also determine the top margin. Use a paper sample to find the correct distance between the two units. The paper sample should fit exactly in between the two units. Fix the units by tightening the knobs and the bolts.

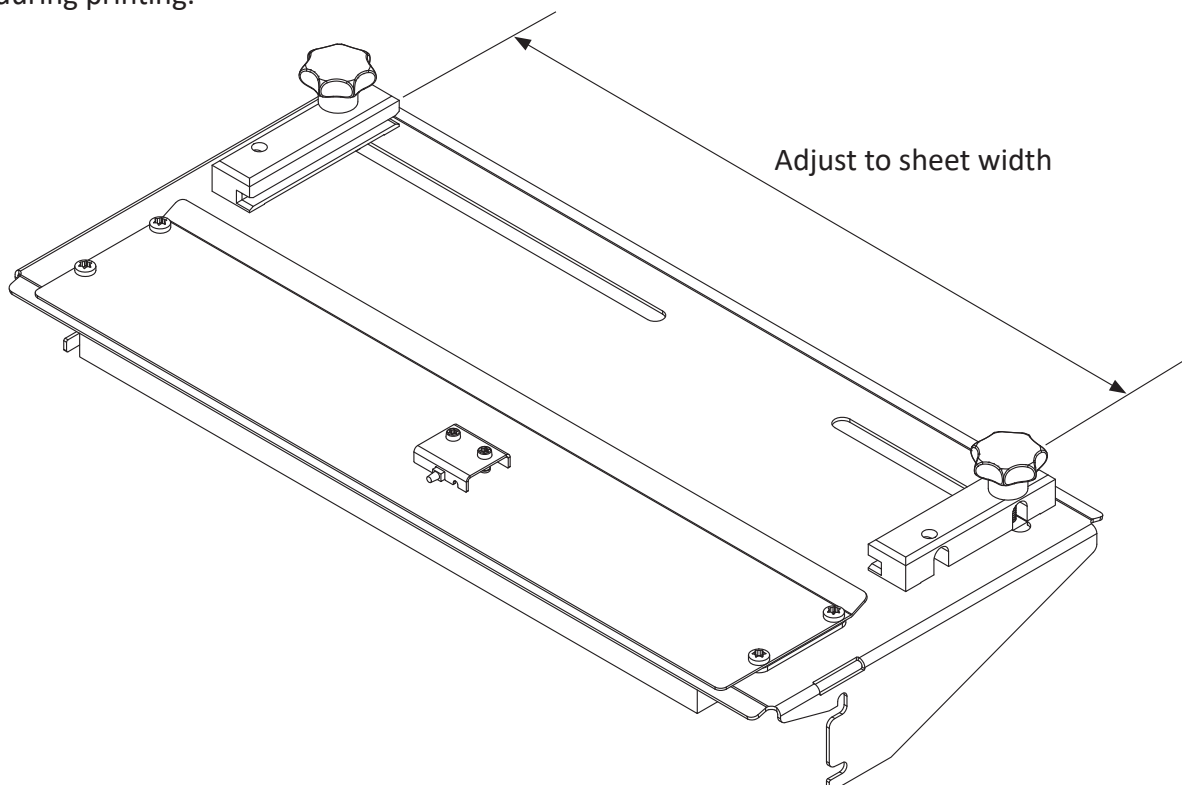


### **Input guides, adjust width**

Before you adjust these two guides, take the paper from the Roll Unwinder and put the paper through the printer, and place it accurately into the already adjusted paper feeder.

Make sure that the paper is aligned correctly and goes straight through the printer.

Then adjust the guides against the edges on the paper, this will keep the paper correct positioned and aligned during printing.



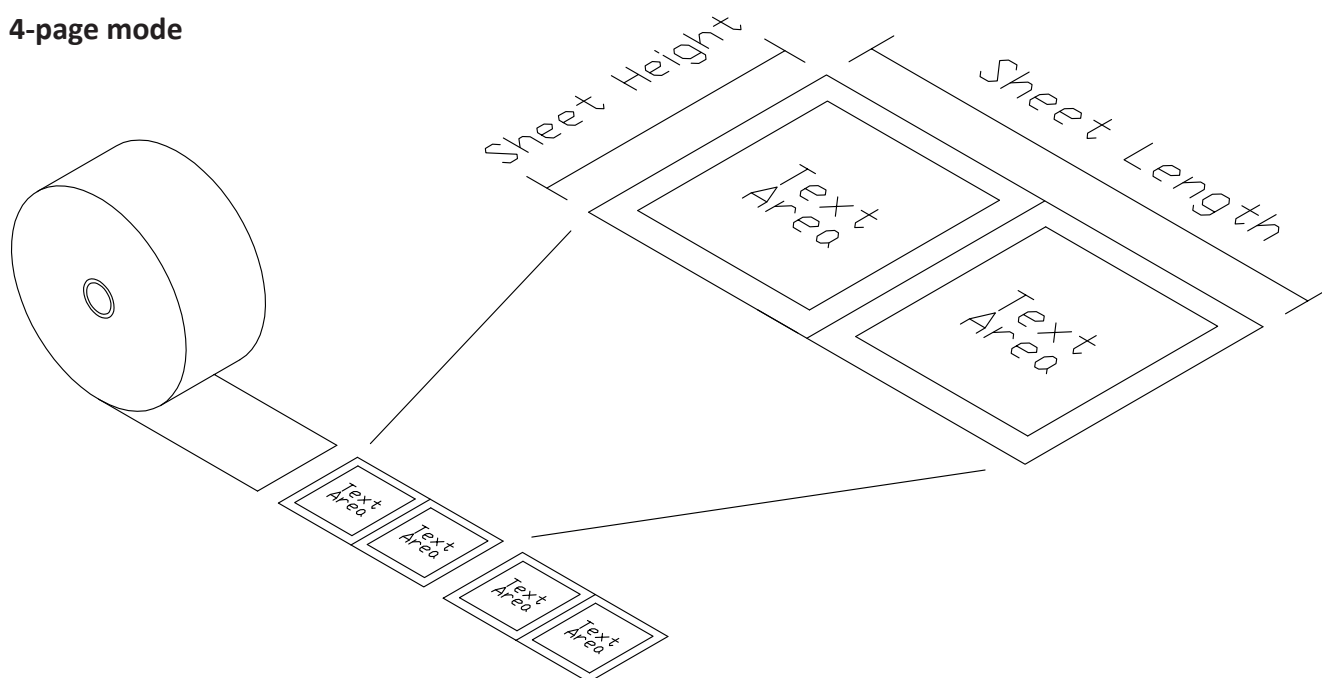
## 4.2 Printing with B650 SF2

This printer is printing interpoint. It also print the text sideways on the paper. This way of printing is creating some confusion regarding the different terms used to describe the sheet of paper. Please see the figures below for the terms Braillo are using.

The printer will use “4-page” mode, meaning the printer will print four pages on each sheet of paper. (Two at each side of the paper). By doing this, it’s possible to put the sheets in a stable and stitch and fold in the middle.

This way of printing makes it easy to produce e.g. a newspaper or magazine in braille.

### 4-page mode



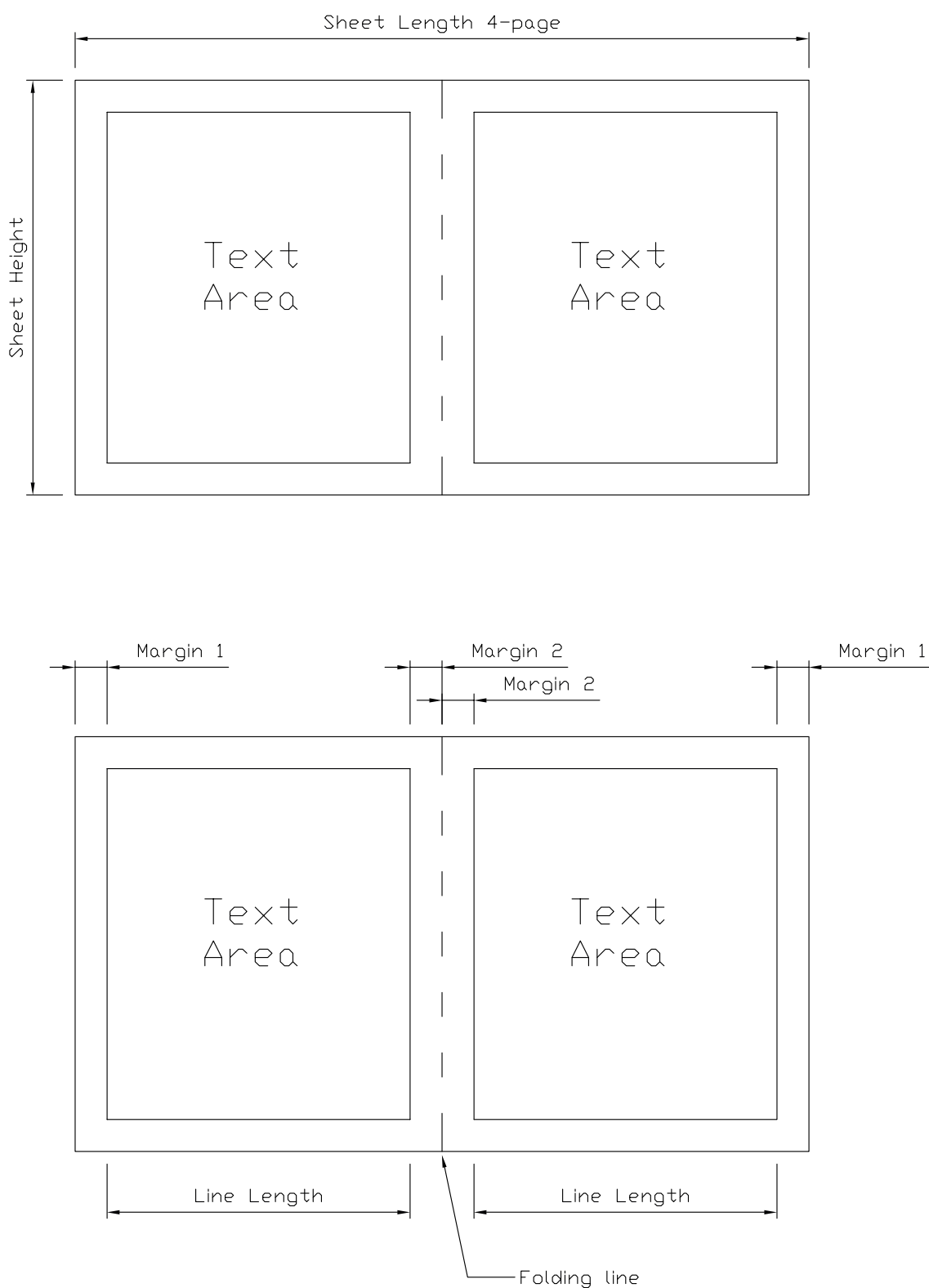
## The sheet in 4-page mode

Please see the figure below.

The “Sheet length” is not a length you can set directly, but it will be a result of the margins and line length settings.

Sheet length = (Margin 1 + Line length + Margin 2) + (Margin 2 + Line length + Margin 1)

Sheet height = Paper roll width



## Printing in 4-page mode

The number of pages sent to the printer in 4-page mode, has to be a number that is possible to divide by four. E.g. a document that contains 7 pages of text, must have one empty page added to get a total of eight pages.

And those eight pages will fit on two sheets (8 pages divided by 4 = 2 sheets).

Next, the text has to be sent to the printer in the following sequence:

Page 1, 2, 7, 8, 3, 4, 5 and 6.

This formatting is normally done with computer software.

To be able to insert cover and staple and fold each copy of a document, the printer also needs a command that will tell how many sheets the document contains. This command is an escape-sequence that must be sent to the printer in the beginning of the document.

This is done by sending the ASCII value no 27, then the letter P, and then the number of sheets.

E.g. in the example above, the command would look like this: `escP02`

(There are software on the market that will do this formatting automatic).

Here are some physical measurements to consider when adjusting the different settings:

Max paper height: 330 mm (13.0 inch) (This is the same as the width of the paper roll).

Max paper length: 584 mm (23.0 inch)

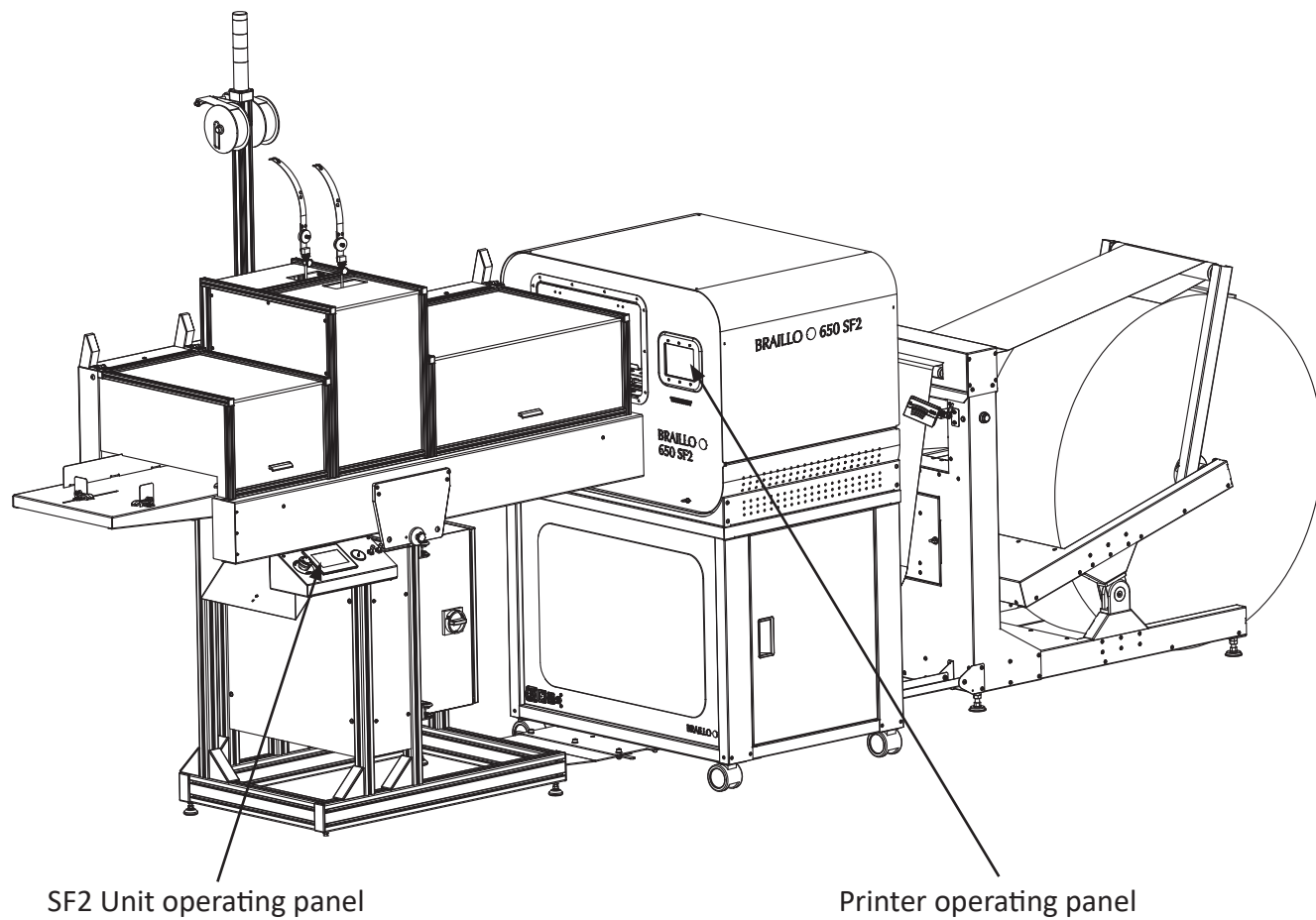
Min. paper length: 417 mm (16.4 inch)

Max no. of characters per. line: 44 char.

Margins are adjustable from 12.7 mm (0.5 inch) to 50.8 mm (2.0 inch) in 2.54 mm (0.1 inch) steps.

Note that it's not possible to use all combinations regarding line length and margins. E.g. if you set the line length to 44 characters there is not enough room for wide margins too. So if the printer receives a document which is formatted outside the limits, the display will let you know.

### 4.3 Operating panels



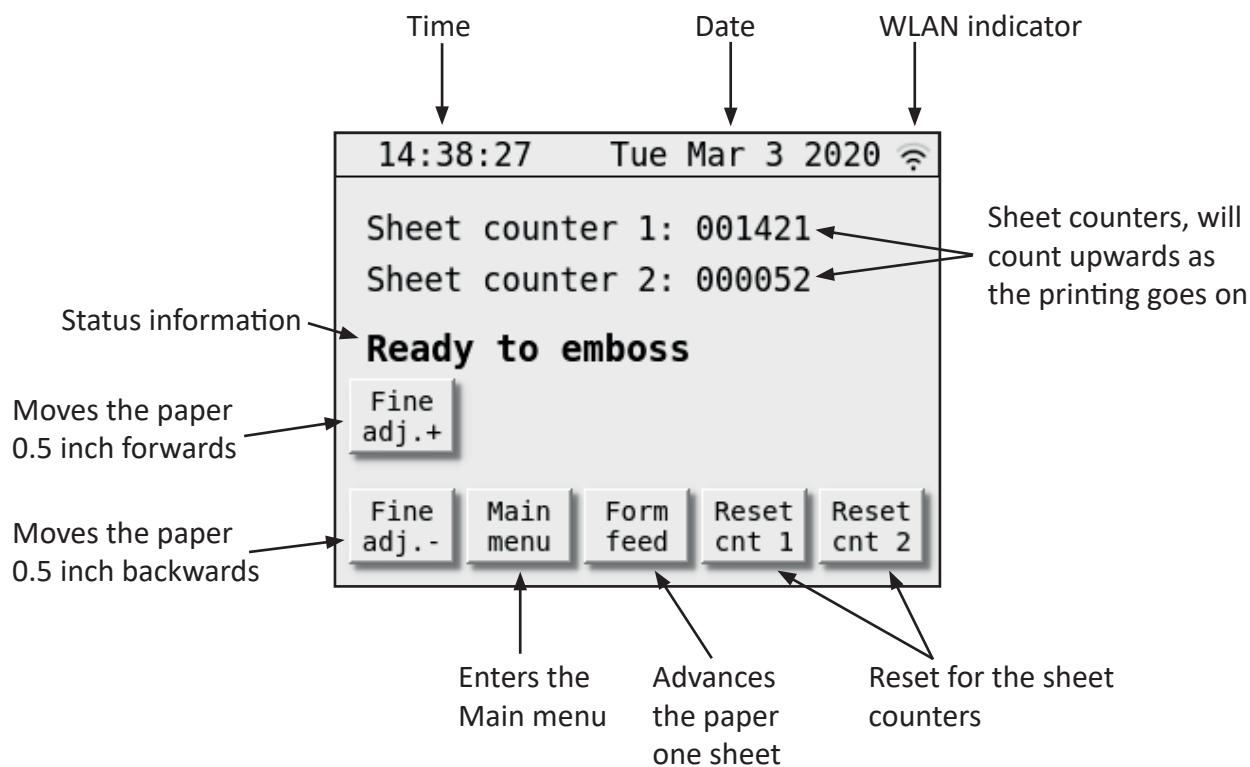
#### 4.4 Basic printer operating panel functions

When the printer is powered up, you have to press the **Accept** button to make the printer ready.



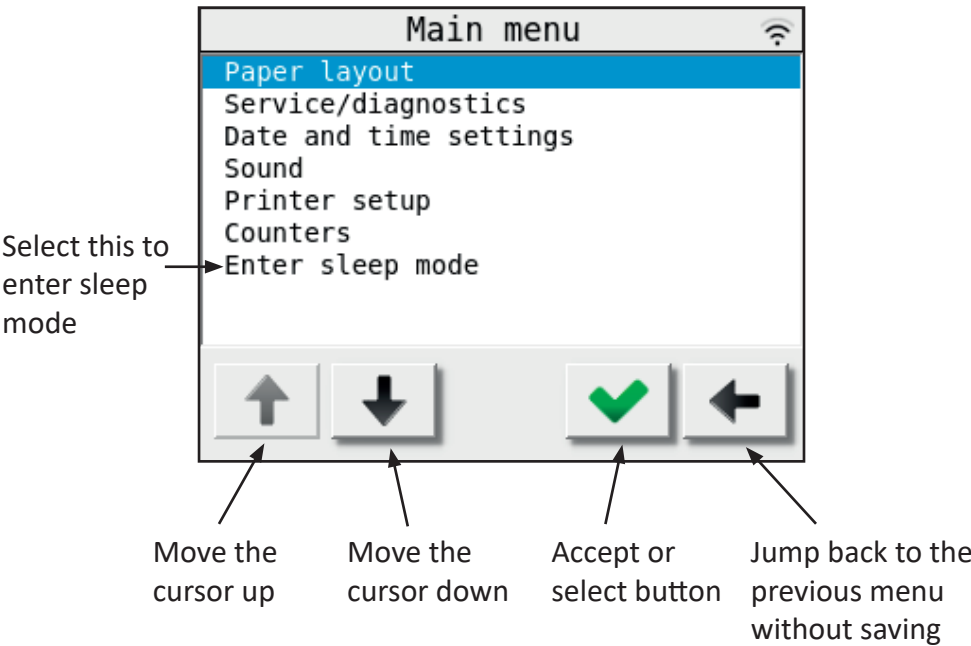
Accept  
button

After pressing **Accept** the window below appears. Please see the explanation on the figure below.



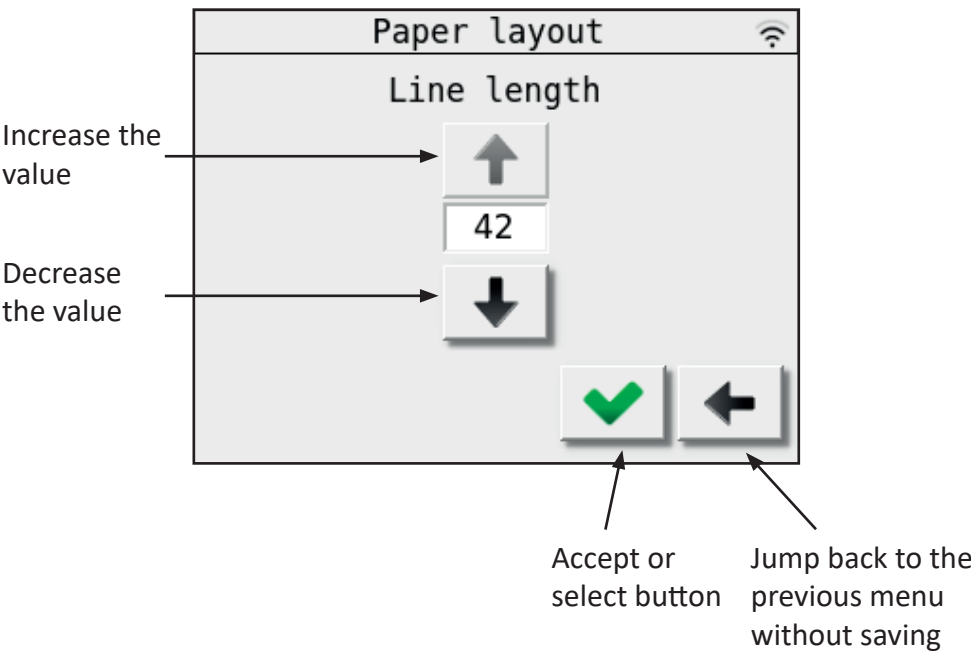
**Navigating in the menus**

Move the cursor to the desired sub menu, and then press the **Accept** button.



**To change a variable setting**

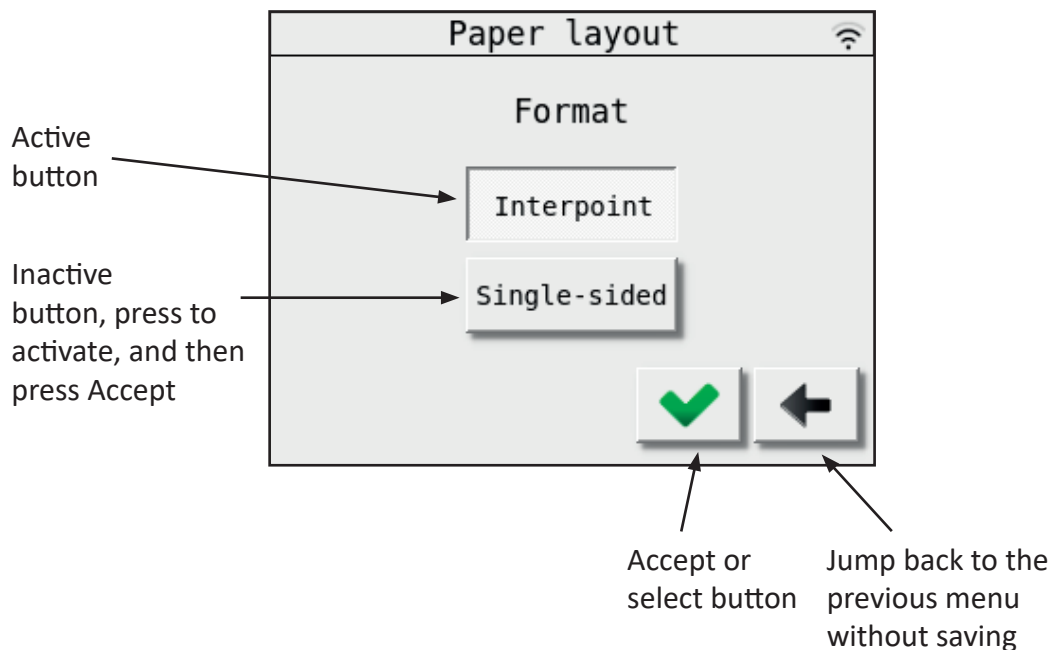
If a setting can have more than two values, the display will look like below.





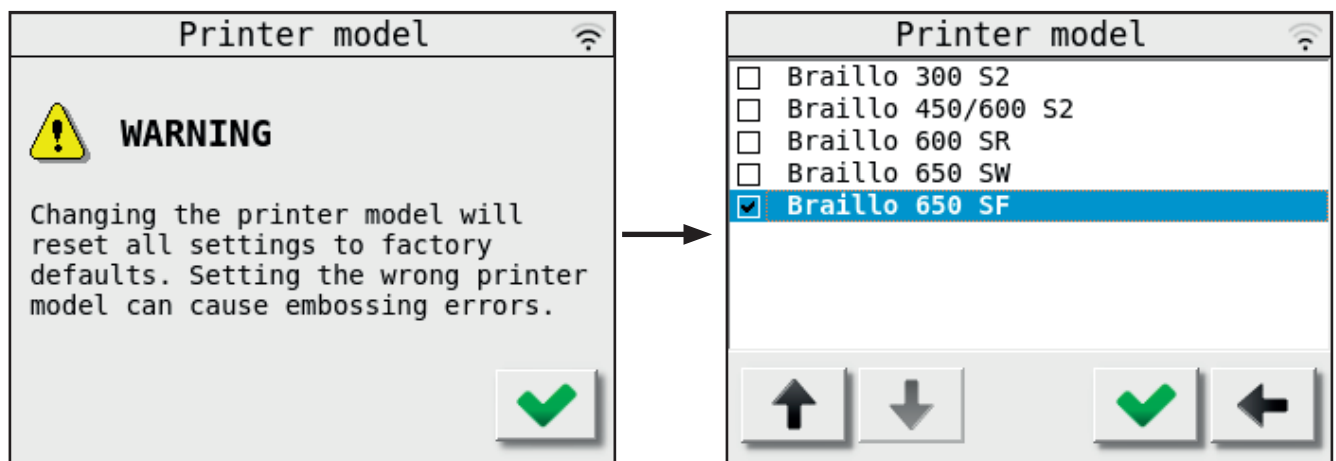
### To change a setting with just two alternatives

If a setting can have just two alternatives, the display will look similar to this.



### Select printer model

The printer model is always set correctly when the printer is shipped, but if the main board for some reason has to be replaced, you have to select the correct printer model.



Note!

The settings set by the operating panel are the default values. However, when sending a text file from the computer, some parameters for this specific job is sent along with the file. The parameters that comes with the file will be active during the print job. When the job is finished, the settings will return to the default settings again.

**Operating panel during printing**

Please see the figure below.

Embossing Sheet 1 / 5 means that the printer is now printing sheet 1 of a print job with 5 sheets in total.

Copy 1 / 1 means there will be just one copy.

If you would like to pause a print job, press the **Pause** button. When the printer is paused, the button will change to **Continue**. Press **Continue** to continue with the printing. If you would like to cancel the rest of the print job, press **Reset**. The printer will then position the paper correctly for the next print job.

14:30:44		Thu Mar 19 2020	
Sheet counter 1: 000421			
Sheet counter 2: 000637			
<b>Embossing ...</b>			
Sheet	<input type="text" value="1"/>	/	<input type="text" value="5"/>
Copy	<input type="text" value="1"/>	/	<input type="text" value="1"/>
<input type="button" value="Pause"/>		<input type="button" value="Reset cnt 1"/> <input type="button" value="Reset cnt 2"/>	

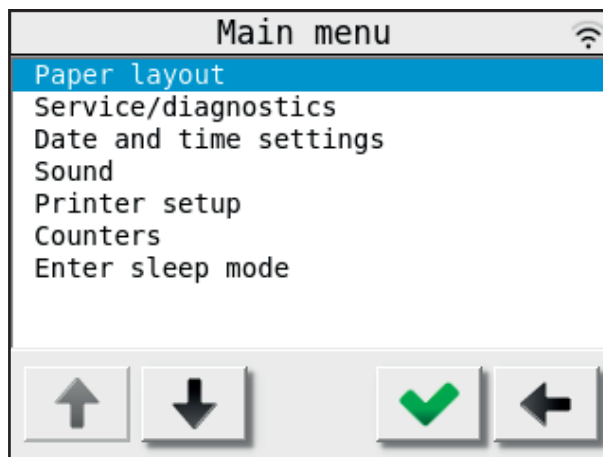
Pause the print job

14:30:44		Thu Mar 19 2020	
Sheet counter 1: 000430			
Sheet counter 2: 000646			
<b>Paused</b>			
Sheet	<input type="text" value="5"/>	/	<input type="text" value="5"/>
Copy	<input type="text" value="1"/>	/	<input type="text" value="1"/>
<input type="button" value="Cont."/>		<input type="button" value="Reset"/> <input type="button" value="Reset cnt 1"/> <input type="button" value="Reset cnt 2"/>	

Continue the print job

Cancel the rest of the print job

## 4.5 Main menu



### The Main menu options

#### [4.6 'Paper layout menu' on page 56](#)

Settings for the braille output layout on paper

#### [4.7 'Service/diagnostic menu' on page 58](#)

Choices for test print patterns, view the log, checking status etc.

#### [4.8 'Date and time menu' on page 61](#)

Settings for date and time

#### [4.9 'Sound menu' on page 61](#)

Settings for the sound

#### [4.10 'Printer setup menu' on page 62](#)

Choose printer model, ASCII tables etc.

#### [4.11 'Counters menu' on page 65](#)

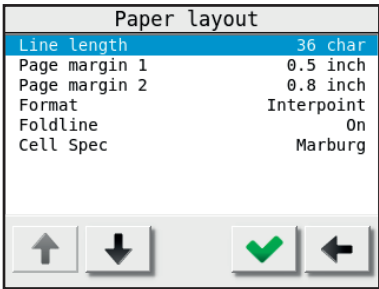
Find the total of how many hours/sheets the printer has been running

Enter sleep mode

Will put the printer directly into sleep mode

4.6 Paper layout menu

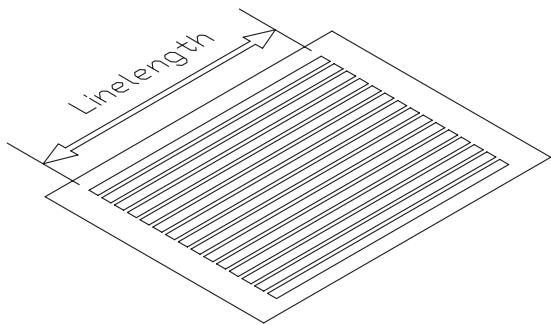
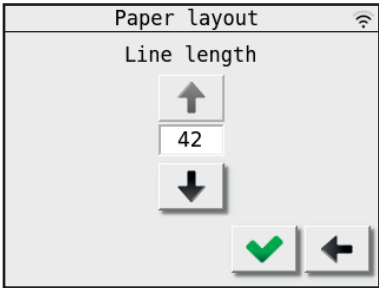
Main Menu - Paper Layout



Line length

Main Menu - Paper Layout - Line Length

The line length is the maximum number of characters that you can have on a single braille line. The range is from 10 to 44 characters.



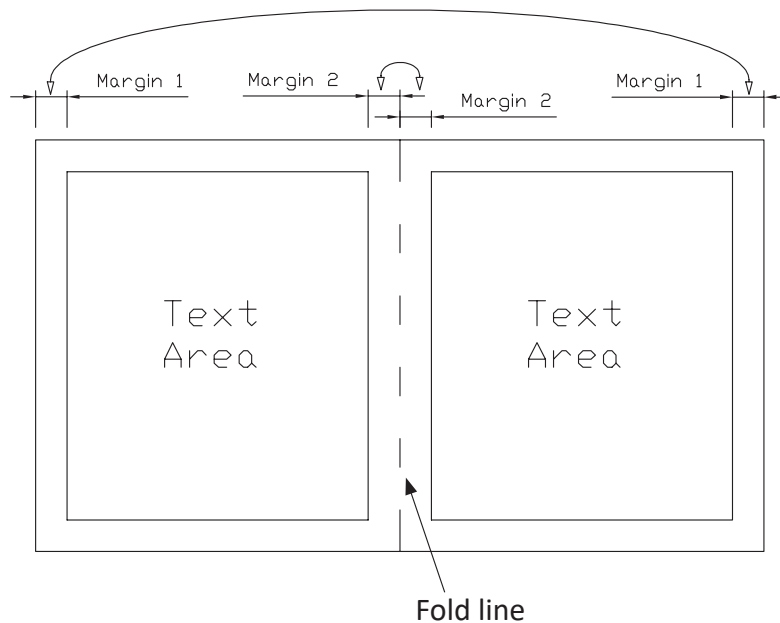
## Page margin 1 and 2

*Main Menu - Paper Layout - Page margin 1/2*

The margins are adjustable from 12.7 mm (0.5 inch) to 50.8 mm (2.0 inch), in 2.54 mm (0.1 inch) increments.

There are two different margins, Margin 1 and Margin 2.

Note that the value on Margin 1 will affect both the “outer” margins, and the value on Margin 2 will affect both the “inner” margins.



## Format

*Main Menu - Paper Layout - Format*

Selects between Interpoint (dots on both sides of the sheet) and Single sided (dots on just one side of the sheet).

## Fold line

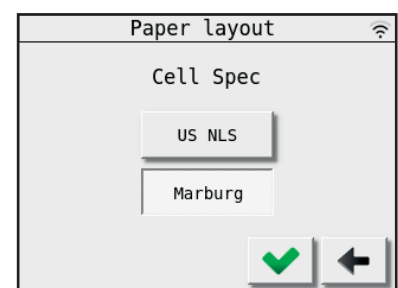
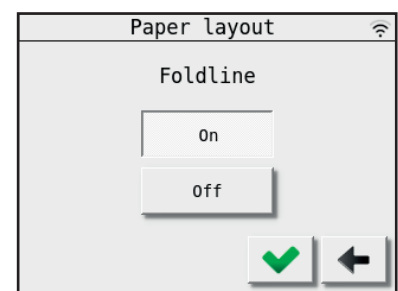
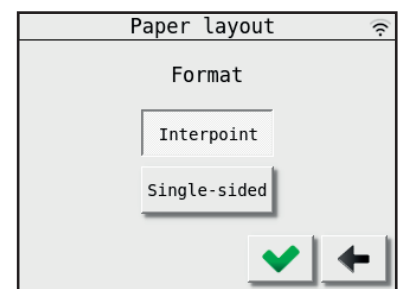
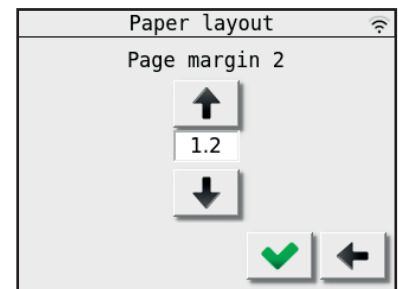
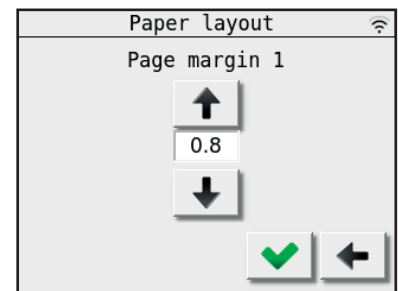
*Main Menu - Paper Layout - Fold line*

Turn on or off a row of dots in the middle of the four-page sheet. This makes it easier to fold the sheet.

## Cell spec

*Main Menu - Paper Layout - Cell spec*

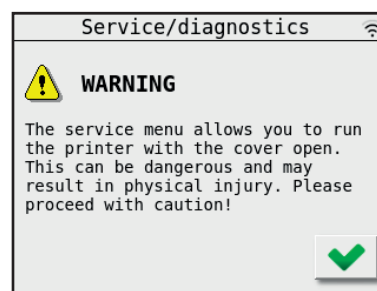
Here you can choose between the Marburg medium standard or the US NLS standard braille cell spacing.




## 4.7 Service/diagnostic menu

*Main Menu - Warning - Service/diagnostic*

When entering this menu choice, a warning window will appear. The purpose of this warning is to make the user aware that the safety switches on the cover are now disabled. This is done to make it possible to run smaller tests during service.

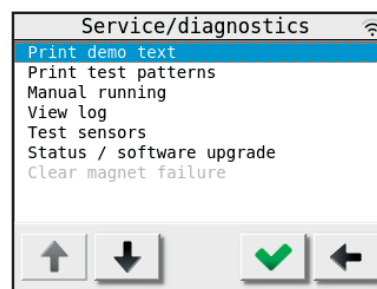


 Please be aware of rotating parts to prevent injuries!  
The printer may be unexpectedly started by other users!

### Print demo text

*Main Menu - Warning - Service/diagnostic - Warning - Print demo text*

Prints a short demo text on approx. one sheet of paper.



### Print Test Pattern

*Main Menu - Warning - Service/diagnostic - Warning -  
Print Test Pattern*

When entering this menu choice, a warning window will appear. This is to make the user aware that print jobs from the computer will not be printed as long as you are in this sub-menu.

- X pattern

Will print dots in a X pattern across the sheet, useful when searching for missing dots.

- Full cell, single sided

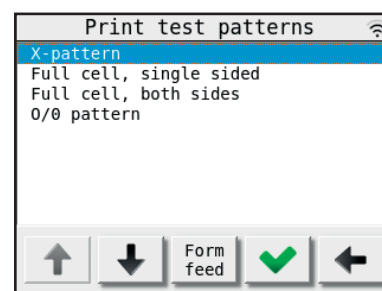
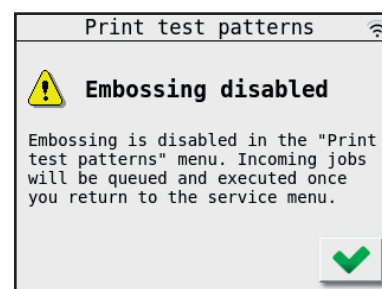
Prints all six dots on all characters on one side of the sheet, useful for dot quality tests.

- Full cell, both sides

Prints all six dots on all characters on both sides of the sheet, useful for testing the paper quality.

- O/Ø pattern

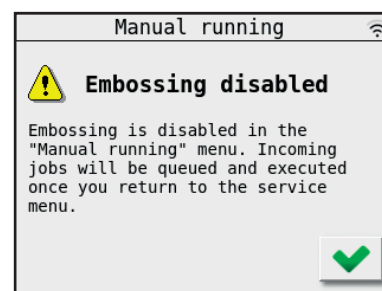
Prints a test pattern made of dot 1,3,5 and 2,4,6, single-sided, useful when searching for extra dots.



## Manual running

*Main Menu - Warning - Service/diagnostic - Warning - Manual running*

When entering this menu choice, a warning window will appear. This is to make the user aware that print jobs from the computer will not be printed as long as you are in this sub-menu.



The function of this menu choice is to activate different functions manually for troubleshooting purposes.

### - Main motor

Use this to manually start and stop the main motor.

### - Step motor

Will run the stepping motor forward approximately one sheet.

### - Signal processor reset

Resets the Signal processor.

### - Send cutting pulse

Sends one cutting pulse to the paper cutter

### - X pattern without motor

Will activate one and one magnet on the magnet racks.

### - Sleep relay

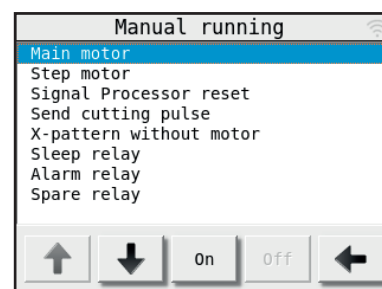
Turn the Sleep relay on or off.

### - Alarm relay

Turn the Alarm relay on or off.

### - Spare relay

Turn the Spare relay on or off.

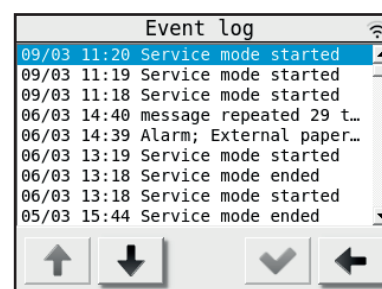


## View Log

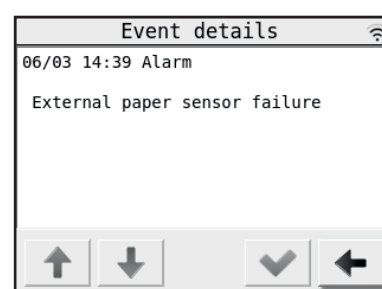
*Main Menu - Warning - Service/diagnostic - Warning - View Log*

The printer remembers the different events that has happened and will store them in a log. This log can be viewed in a list like the figure to the right. If a message is repeated several times, the display will show a line with the text "last message repeated x times".

Use the up and down arrow to scroll the list.



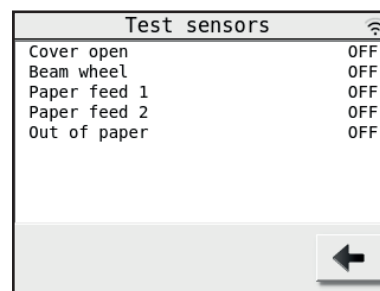
If the **Accept** button is shown in green, it's also possible to view some more details about this particular event by pressing the **Accept** button.



## Test Sensors

*Main Menu - Warning - Service/diagnostic - Test sensors*

This is a function made for troubleshooting the sensors on the printer. The “ON” or “OFF” is indicating the current status of the sensor. To find out if a sensor is OK, the sensor can be switched on and off physically, and the text in the display will change between “ON” and “OFF” accordingly if the sensor is functioning.



- Cover open                      Safety switches on the panels on the printer.
- Beam wheel                    Sensor fitted on the lower shaft on the printer.
- Paper feed 1                  Sensor 1 on the paper feed tractor.
- Paper feed 2                  Sensor 2 on the paper feed tractor.
- Out of paper                  Sensor to check if there is paper in the printer.

## Status / Software upgrade

*Main Menu - Warning - Service/diagnostic - Status / Software upgrade*

Will show the printers current IP addresses, the MAC addresses and the current software version (Eth. = Ethernet).

### - Software update:

It's possible to update the printers internal software. You will need a file with the newer software version, which you can get from Braillo Norway AS or a Braillo distributor.

The file must then be copied to a USB memory stick.

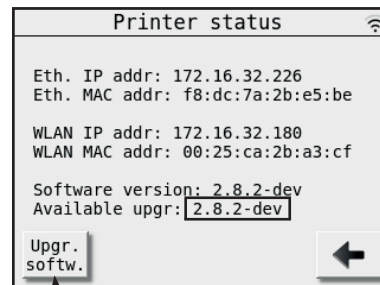
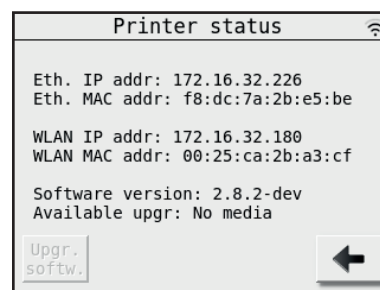
Place the memory stick in the USB type A connector on the main board. See section [6.29 'Main board - connections' on page 128](#) for info about where to find it.

The printer will only look for other available software versions when the 'Status/Software upgrade' window is opened, so if the upgrade does not appear in the display, go one step back to the Service menu and then back into the 'Status/Software upgrade' window.

Now the new software version will appear at 'Available upgr:', and the 'Upgr. softw.' button will be active. Press the button to upgrade.

The printer will go through an updating sequence, and do a regular booting when it's finished.

All settings and counters will be kept and used with the new software version.

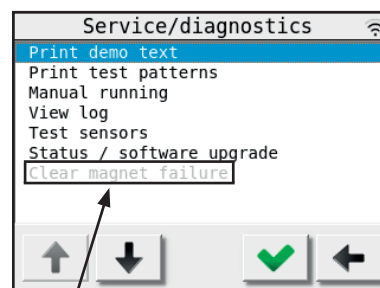


Upgrade software button

## Clear magnet failure

*Main Menu - Warning - Service/diagnostic - Clear magnet failure*

This menu choice is normally not active, but if there has been detected a faulty magnet during printing, a magnet symbol will be shown in the 'Ready to emboss' window. Now the 'Clear magnet failure' becomes active in the Service/diagnostics menu and the magnet failure can be reset.



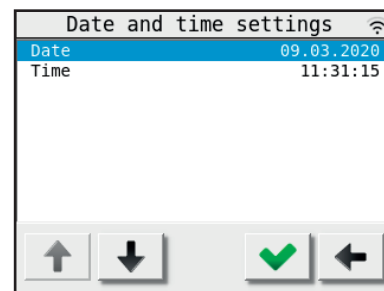
The Clear magnet failure choice



## 4.8 Date and time menu

*Main Menu - Date and time*

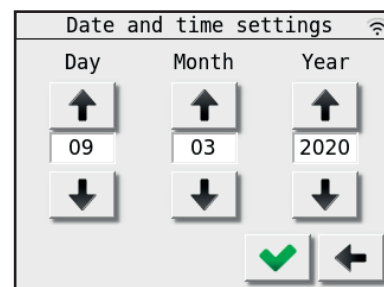
Used to change the date and time setting.



### Date

*Main Menu - Date and time - Date*

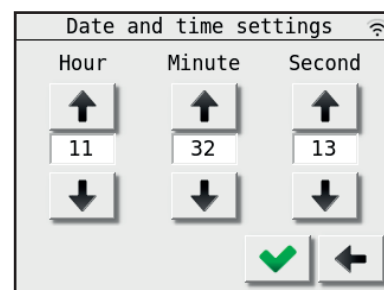
Used to change the date.



### Time

*Main Menu - Date and time - Time*

Used to change the time.



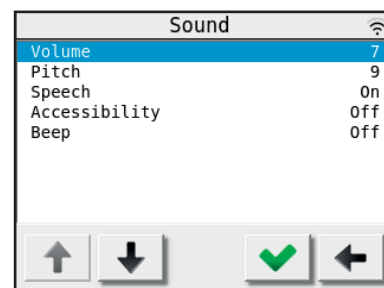
## 4.9 Sound menu

*Main Menu - Sound*

### Volume

*Main Menu - Sound - Volume*

Volume setting for beep, speech, and alarm.



### Pitch

*Main Menu - Sound - Pitch*

Sets the pitch level for the beep.

### Speech

*Main Menu - Sound - Speech*

Toggles Speech on or off.

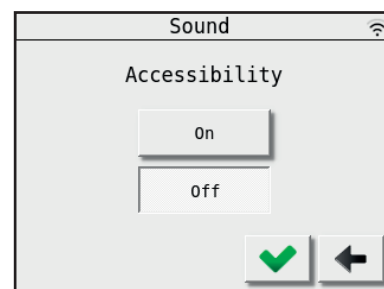
### Accessibility

*Main Menu - Sound - Accessibility*

Toggles Accessibility on or off.

If this is set to on, pressing a button will result in the button's function being read out by Speech.

The next press will then activate the button.

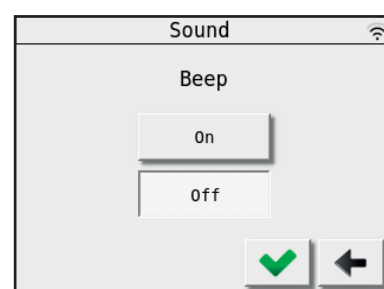


### Beep

*Main Menu - Sound - Beep*

Toggles Beep on or off.

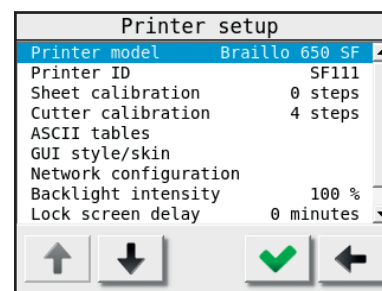
If on, the printer will sound a short beep when a button is pressed.



## 4.10 Printer setup menu

### Main Menu - Printer setup

In this menu the basic settings regarding the printer is set.



### Printer model

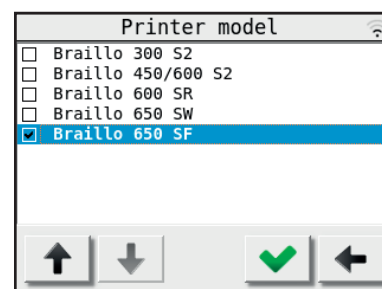
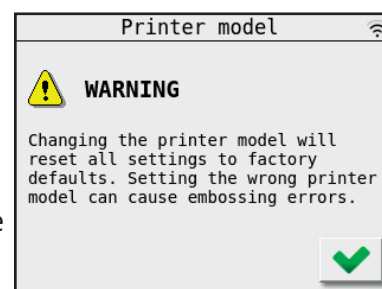
#### Main Menu - Printer setup - Warning - Printer model

When entering this menu choice, a warning window will appear.

Braillo Norway AS has a number of different printer models that can use the same electronics. But the different printer models have different settings and different functions. This menu choice is where you select the specific printer model. The software will then be adapted to the printer in use.

This setting is fixed at the factory, and should under normal conditions never need to be changed.

However, if the main board in the printer for some reason has been replaced, you have to make sure that the correct printer model is selected here.

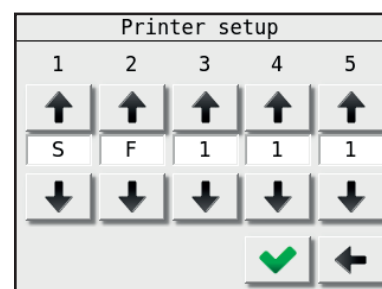


### Printer ID

#### Main Menu - Printer setup - Printer ID

The printer has a function to make it possible to identify which printer has printed a particular braille book. It's done by sending a command along with the braille book that tells the printer to print its identification. On this setting you can set a 5 character code or name that identifies this particular printer.

Also when more than one printer is connected with USB to the same computer, the printer ID must be set. This must be done to give the connected printers unique ID's in the computer.



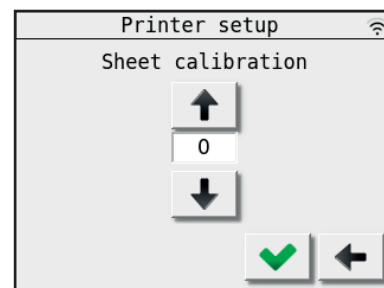
## Sheet calibration

### Main Menu - Printer Setup - Sheet calibration

This is a function that makes it possible to make small adjustments on the width of the sheet. There is a value that can be set from -10 to +10. If the value is 0, there is no correction.

Negative numbers will give you a narrower sheet.

Positive numbers will give you a wider sheet.



## Cutter calibration

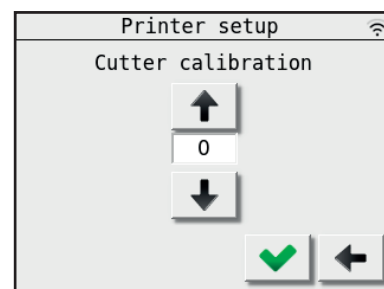
### Main Menu - Printer Setup - Cutter calibration

This function adjusts the position of the cut related to the printed pages. The paper sheet length stays the same.

The value can be set from -16 to +16.

Positive numbers gives a wider left and a narrower right margin on the sheet. Negative numbers gives a narrower left and a wider right margin on the sheet.

See [“4.16 Cutter calibration” on page 72](#) for more information.

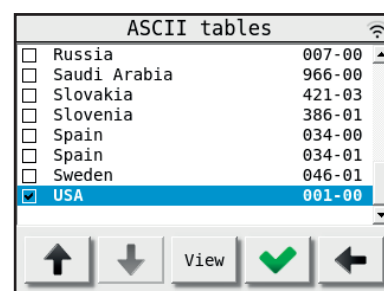


## ASCII tables

### Main Menu - Printer setup - ASCII tables

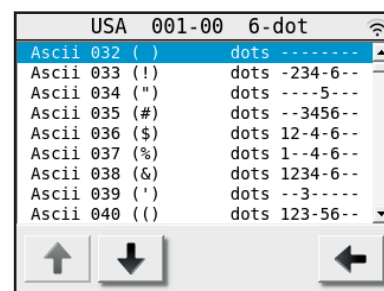
An ASCII table is the same as a character set. When the printer receives a character from the computer, it goes to an ASCII table to find out which dot pattern is corresponding to this character.

This printer has a number of ASCII tables, and they are listed like shown in the figure to the right. To select another table, use the up or down arrow and press the green **Accept** button. Now this has become the current table.



It's also possible to view the translation between characters and dots in the different ASCII tables by pressing the "View" button.

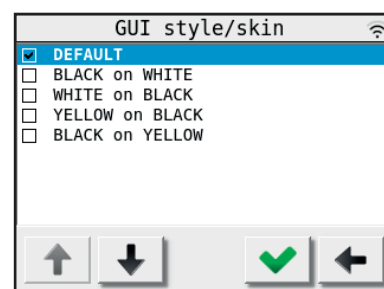
Then a list like shown on the right will appear. Use the up and down arrows to scroll the list.



## GUI style/skin

### Main Menu - Printer setup - GUI style/skin

If any users of this printer has low vision and/or find it difficult to read the operating panel, it's possible to change the background and text colours to get better contrast.



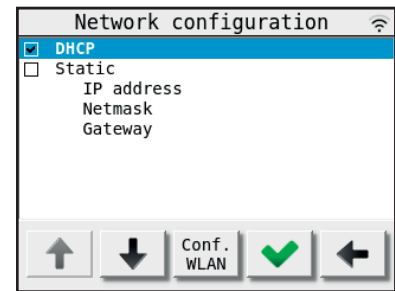
## Network configuration

*Main Menu - Printer setup - Network configuration*

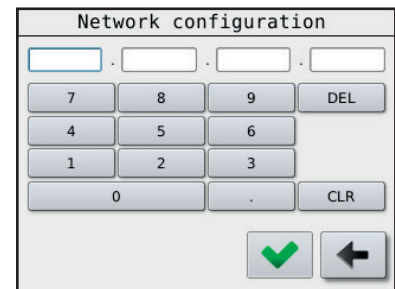
This menu choice gives you the possibility to choose between:

- **Regular DHCP IP address (default setting)**
- **Static IP address**

Note with static IP you have to set all the three network parameters manually, and all three has to be set.



The three different settings for the static IP is set using the buttons as shown in the figure to the right. Type the numbers into the first text cell, then tap the next cell to move to it. When all four numbers are set, press the green **Accept** button to go back to the Network configuration menu.



## - Wireless configuration

To start the set up for connecting to a WLAN network, press the button 'Conf. WLAN'.

Now the printer will start to transmit on a temporary WLAN network with the SSID and password shown in the display.

Note that the password changes every time, so if you have to do this more than once, remember to always use the latest password.

See [3.7 'Wireless network \(WLAN\)' on page 41](#) for more information.

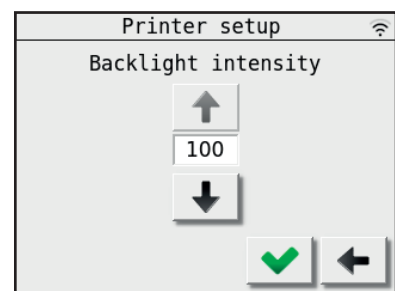


## Backlight intensity

*Main Menu - Printer setup - Backlight intensity*

Setting for the backlight intensity on the display.

Can be set from 15 % to 100 %.



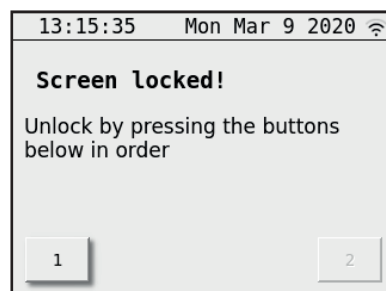
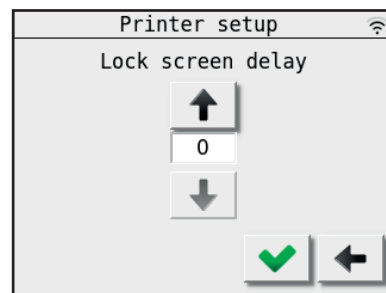
### Lock screen delay

*Main Menu - Printer setup - Lock screen delay*

Setting the delay in minutes after the operating panel has been used before the screen get locked. 0 is screen lock off.

The Lock screen function is to avoid that buttons are accidental pressed.

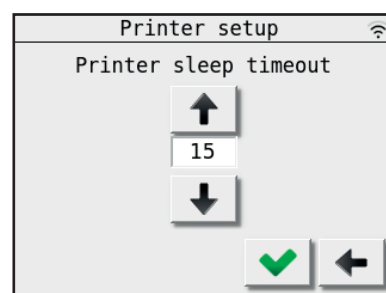
To unlock the locked screen, press first button 1, then button 2.



### Printer sleep timeout

*Main Menu - Printer setup - Printer sleep timeout*

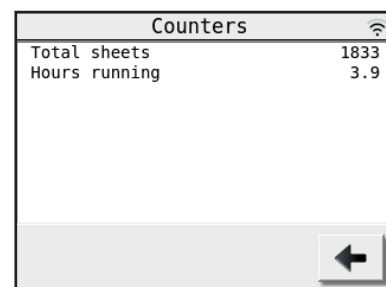
Setting the time in minutes after the operating panel has been used or the printjob is finished before the printer goes into the sleep mode.



## 4.11 Counters menu

*Main Menu - Counters*

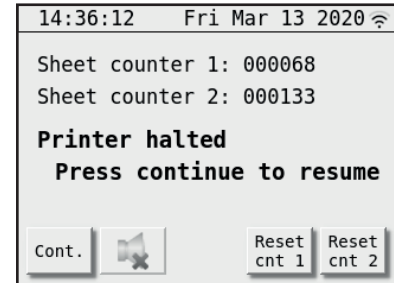
Will show two different counters, the first one will show the total number of sheets printed. The second shows the total number of hours the main motor has been running (the time the printer has actually printed).



## 4.12 Display messages

When there is a problem, the display will show what has happened e.g. “Printer halted, Printer cover open”. And it will stay like that until the error is fixed. Then the display will change to “Printer halted, Press continue to resume”. By pressing **Continue** the printer will resume the printing from where it was before the error.

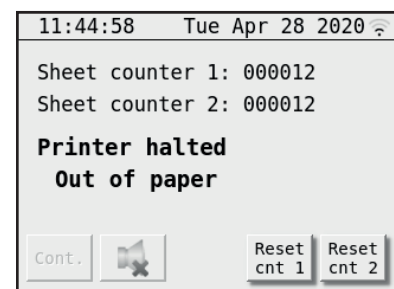
### - Press continue to resume



### - Out of paper

The printer has run out of paper and is waiting for paper.

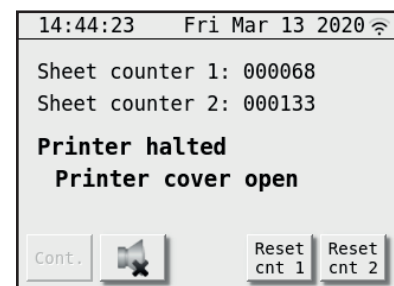
When paper is detected, the display will change to “Press continue to resume”.



### - Printer cover open

This occurs when one or more panels on the printer cover are open.

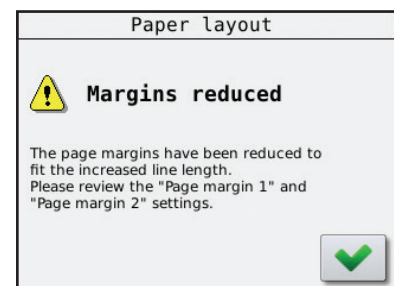
When the side panels are put back in place, the display will change to “Press continue to resume”.



### - Margins reduced

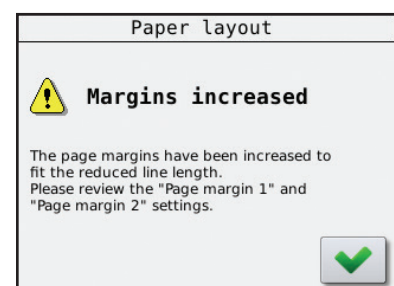
The line length has been increased so the total sheet size has exceeded its maximum size (585 mm). This is automatically corrected by reducing the margins accordingly. Please check the Page margin 1 and 2 settings.

(Main Menu - Paper Layout - Page margin 1/2)



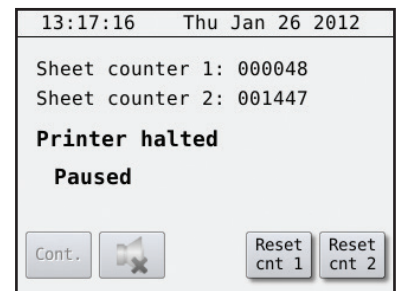
### - Margins increased

The line length has been decreased so the total sheet size is reduced to under its minimum size (417 mm). This is automatically corrected by increasing the margins accordingly. Please check the Page margin 1 and 2 settings. (Main Menu - Paper Layout - Page margin 1/2)

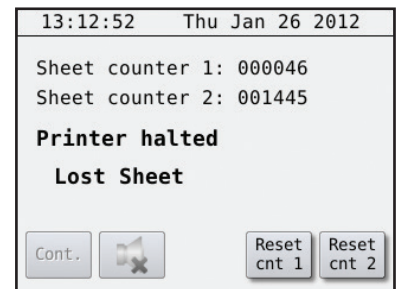


**- Paused**

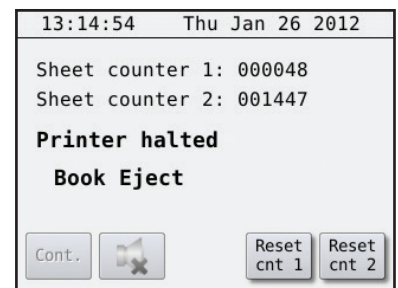
The SF2 Unit has sent a Pause command, or one of the hatch has been opened during printing. When the Pause command is repealed, the display will change to “Press continue to resume”.

**- Lost sheet**

The vacuum arm on the SF2 Unit has lost a sheet of paper. When the problem is solved and the hatches is closed again, the display will change to “Press continue to resume”.

**- Book eject**

The finished stapled and folded book did not fall down. Open the hatch and push the book down the slide and close the hatch. The display will change to “Press continue to resume”.



### 4.13 Unrecoverable errors

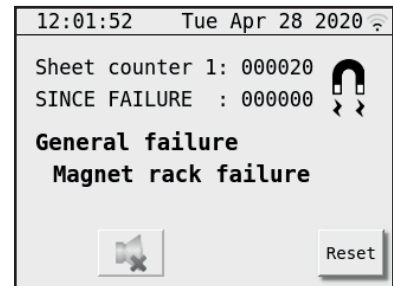
When there is an unrecoverable error, the display will show what has happened e.g. “General failure, Beam wheel failure”. When this kind of errors occurs, the printer must be reset or switched off and then switched back on again.

The job currently being printed has to be sent once more from the computer. The different unrecoverable errors are:

#### - Magnet failure

A defect magnet has been detected during printing. The display will say “General failure, Magnet rack failure” and the magnet symbol will appear in the upper right hand corner of the display. The printer will stop. Check the log for the details.

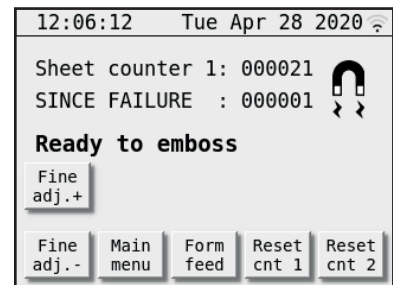
*(Main Menu - Warning - Service/diagnostic - Warning - View Log)*



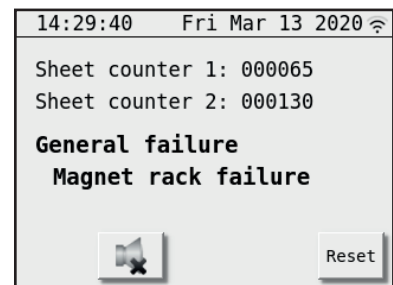
When trying to print after a defect magnet is found and replaced, the display will still show the magnet symbol in the top right hand corner. This is because you have to reset the magnet failure.

To reset the magnet failure, you have to select the menu choice **Clear magnet failure**. See '[Clear magnet failure](#)' on page 60 for more info.

*(Main Menu - Warning - Service/diagnostic - Clear magnet failure)*



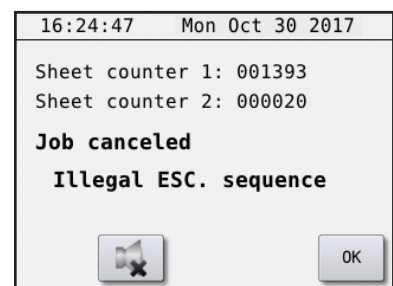
If the display shows “General failure, Magnet rack failure” without the magnet symbol in the top right corner, it means that there has been detected error(s) in e.g. the data transmission between the main board and the magnet racks, or it could be a broken fuse for the power to one magnet rack.



#### - Illegal ESC sequence

The printer has received an ESC sequence that it does not recognize, it's placed in wrong location on the page or contains invalid parameters.

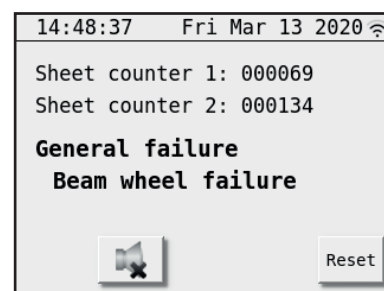
Press OK to continue.





### - Beam wheel failure

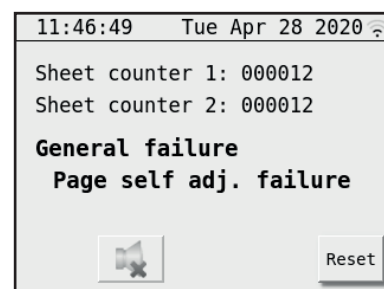
This means that the pulses from the Beam wheel sensor is not registered in the electronics. This can be caused by e.g. defect sensor, disconnected sensor, broken main belt or defect main motor. If you can hear the main motor start, it's probably something wrong with the sensor. But if you cannot hear the motor start, it's probably something wrong with the main motor. Press Reset to continue. The sensor can be tested manually on *Main Menu - Warning - Service/diagnostic - Test Sensors*.



### - Page self adj. failure

The printer has detected position problems with the paper feeding on e.g. power up or resetting. Could be caused by e.g. a defect/disconnected sensor or stepping motor. The sensors can be tested manually on *Main Menu - Warning - Service/diagnostic - Test Sensors*. Please check the log for the details.

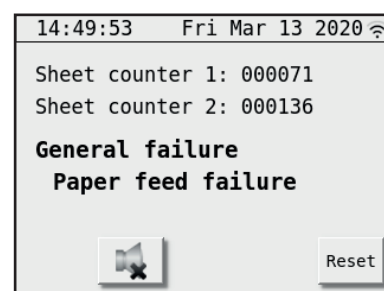
(*Main Menu - Warning - Service/diagnostic - Warning - View Log*)



### - Paper feed failure

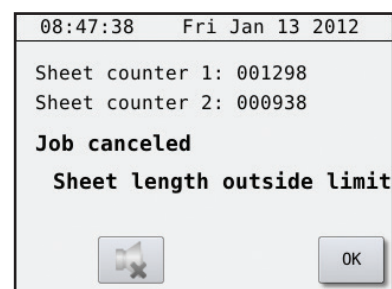
During printing, the printer has detected that the paper position is not where the electronics is expecting it to be. This may be caused by e.g. the paper is stuck so the stepping motor is slipping, stepping motor is disconnected or defect or one of the two paper feed sensors are disconnected or defect. Press Reset to continue.

The sensors can be tested manually on *Main Menu - Warning - Service/diagnostic - Test Sensors*.

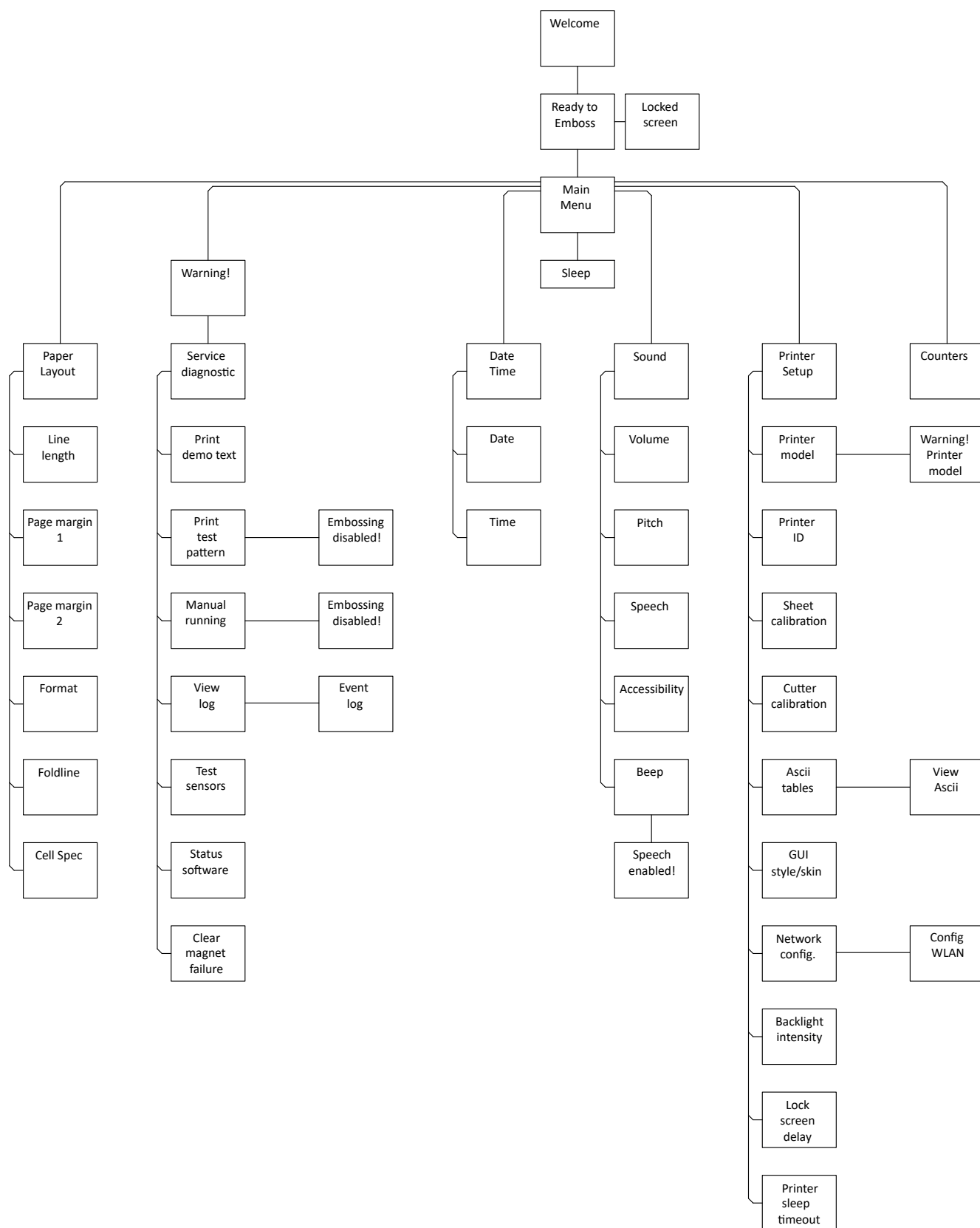


### - Sheet length outside limits

The sheet length can be min. 417 mm and max. 585 mm (text and margins). If a print job sent from the computer has ESC sequences that dictates a line length/margin combination that will exceed the max. or go below the min. sheet length, the print job is cancelled. Press OK to continue.



## 4.14 Overview of the menu structure.



## 4.15 Test Print

The test print program is designed to ensure that the 180 printing mechanisms functions properly.

This printer will do an electronic test on all of it's printing mechanisms continuously during printing. However, this electrical test will not tell if something is wrong mechanically, and therefore it's recommended to print a few pages of test print before beginning the day's production.

By doing so, it's quite easy to see if all printing mechanisms are functioning mechanically.

This printer has both single-sided and double-sided (interpoint) test print patterns.

The test print consists of four different patterns. See the description below.

How to use the test print:

### Print Test Pattern

*Main Menu - Warning - Service/Diagnostic - Warning - Print Test Pattern*

When entering this menu choice, a warning window will appear. This is to make the user aware that print jobs from the computer will not be printed as long as you are in this sub-menu.

#### - X pattern

Will print dots in a X pattern across the sheet, useful when searching for missing dots.

#### - Full cell, single sided

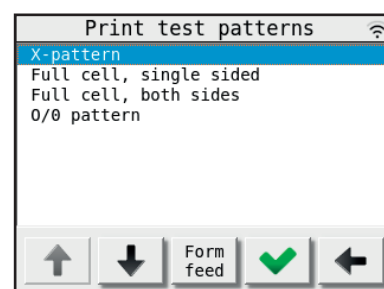
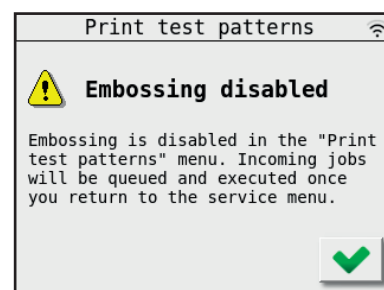
Prints all six dots on all characters on one side of the sheet, useful for dot quality tests.

#### - Full cell, both sides

Prints all six dots on all characters on both sides of the sheet, useful for testing how the paper quality can take heavy printing.

#### - O/Ø pattern

Prints a test pattern made of dot 1,3,5 and 2,4,6, single-sided, useful when searching for extra dots.

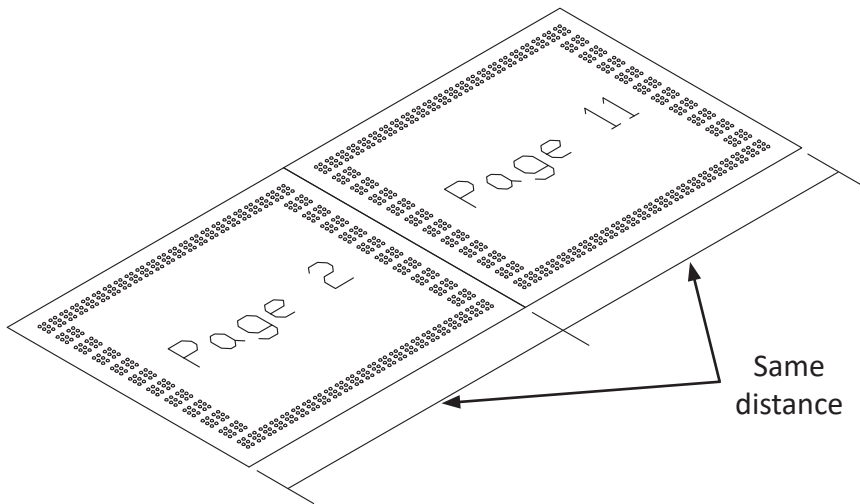


Section [6.3 'Printing principle' on page 82](#) illustrates how the printing mechanisms are placed.

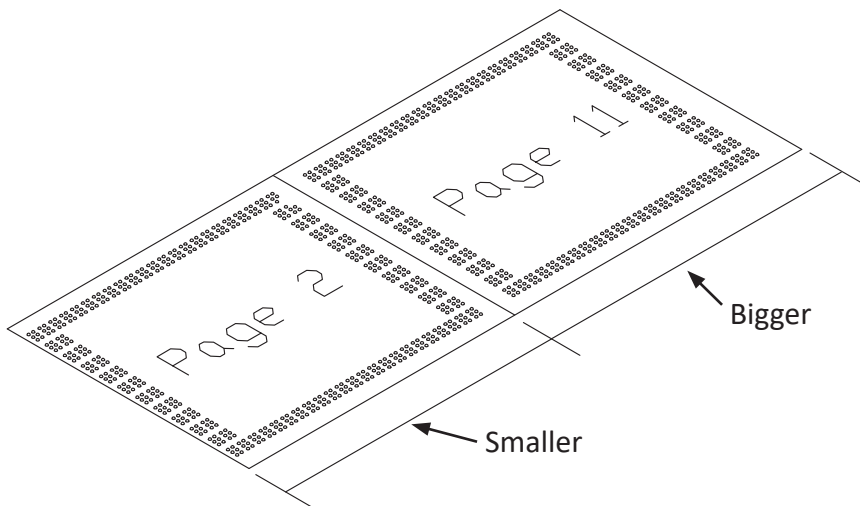
Instruction for troubleshooting will be illustrated by examples in section [6.4 'Troubleshooting, incorrect braille' on page 88](#).

## 4.16 Cutter calibration

The cutter calibration is adjusting the position of the cut related to the printed text on the sheet. Measure from the edge till the center of the printed text (or the fold line).

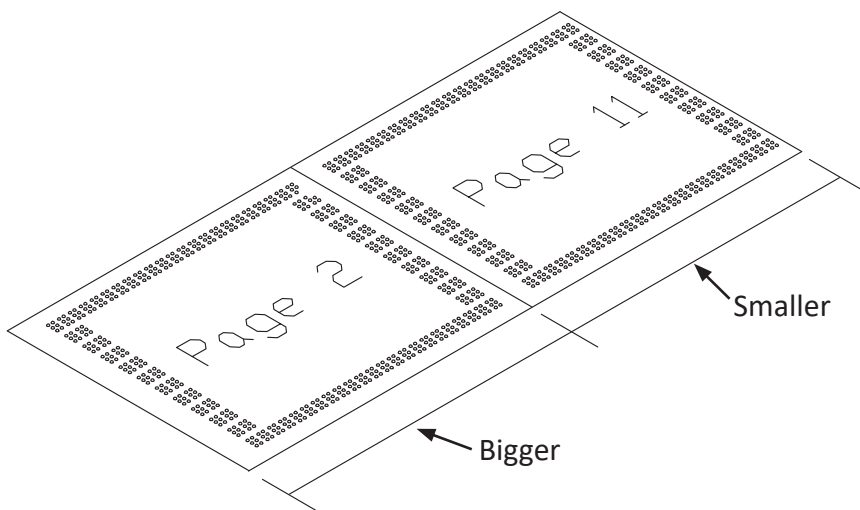


If the cutter calibration is correctly adjusted, the cut should be placed on the sheet like shown in the figure to the left. The distance from the cut to the fold line will be the same on both sides of the cut.



If the cutter calibration is adjusted too high, the cut will be placed nearer to the printed text on the starting edge of the paper.

In this case, decrease the value on the cutter calibration.



If the cutter calibration is adjusted too low, the cut will be placed further away from the printed text on the starting edge of the paper.

In this case, increase the value on the cutter calibration.

## 5. OPERATING THE SF2 UNIT

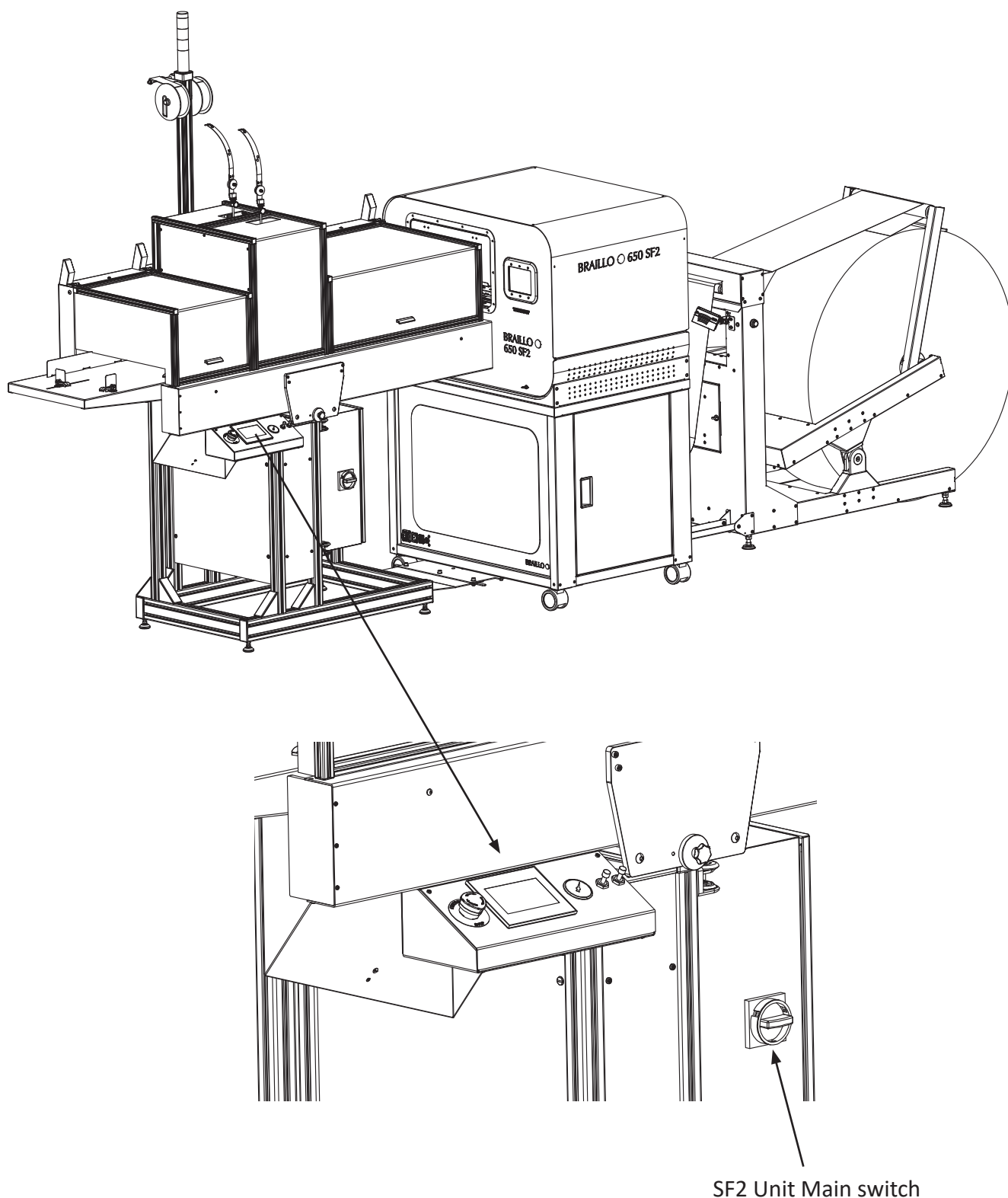
See also chapter “8. SF2 UNIT” on page 140 for more information.



**Note!** There is crushing hazard on the SF2 Unit!

Turn off the SF2 Unit Main switch before assembling, maintenance, and repair!

**Note!** Do not turn on or operate the SF2 Unit with the hatches open!



SF2 Unit Main switch

## 5.1 SF2 Unit - Main menu



The Main menu consist of the four buttons in the upper part of the screen, and the functions are:

**- Reset**

This resets the SF program.

**- Pause**

Depending on the previous pause setting, pressing Pause will toggle Pause on and off.

If you are turning pause on, it will send a pause signal to the printer, and the printer will stop.

To restart, open and close one of the hatches or select Pause again. When the message "Press continue to resume" appears on the printer display, press the "Continue" button.

**- Setup**

Takes you to the setup menu.

**- Manual**

Opens a menu where it's possible to run different functions manually.

## 5.2 SF2 Unit - Setup menu



### - Cover over length

When the cover sheet is physically longer than the book, you need to compensate for this to be able to get the cover positioned in the centre on top of the book. This value can be set from 0 to 50 mm. The best way to find the correct value is to learn by experience. Tap the number to change the value.

### - Cover pick up position

This function is used to adjust the position of the cover sheet where the vacuum arm is picking up the cover. It may be necessary to adjust this position if it becomes difficult to pick only one cover sheet at a time. This is because different paper types may behave differently.

The value can be set from 0 to 30 mm.

We recommend that this adjustment is used in conjunction with the splitter and the vacuum adjustment to ensure that just one cover sheet is picked at a time.

Tap the number to change the value.

### - Stitching ON/OFF

Used to turn the stitching on or off, if turned off, the volumes will be folded but not stitched.

### -Stitch and Fold ON/OFF

Used to turn off both the stitching and folding functions.

### - Cover ON/OFF

This function is used to select if you want to make books with a cover sheet or not.

### - LogIn/LogOut

Required for entering the Servo setup menu. For service personnel only! When pressing this, you will need to enter a four-digit pin code to activate the Servo button. The pin code is 1234.

### - Home

Return to the main menu.

### - Servo

Enters the menu for the servo settings. Only available after log in.

### 5.3 SF2 Unit - Manual menu



**- Man Stitch (Manual stapling)**

Used to manually activate the staplers. Useful when adjusting the staplers.

**- Man cut (Manual cutting)**

Used to manually activate the paper cutter.

**- Man Fold & Stitch**

Will run the folding and stitching procedure once.

**- LogIn/LogOut**

Required for entering the Servo setup menu. For service personnel only!

When pressing this, you will need to enter a four-digit pin code to activate the Servo button. The pin code is 1234.

**- Home**

Return to the main menu.

**- Servo**

Enters the Servo setup menu. Only available after log in.



## 5.4 SF2 Unit - Servo Setup menu

Note! For service personnel only! Log in required. See section “5.2 SF2 Unit - Setup menu” on page 75 for log in information.



### - Jog FWD

Runs the vacuum arm manually forwards.

### - Jog REV

Runs the vacuum arm manually backwards.

### - Sheet mover

Shows the current position for the vacuum arm.

### - Be careful! - Start Home

Will set the servo reference position to zero on the vacuum arm's current position.

### - Jog speed

The speed the servo will use when pressing the 'Jog REV' and 'Jog FWD' buttons.

### - Error Code

Displays eventually error codes from the servo amplifier.

### - Warning Code

Displays eventually warning codes from the servo amplifier.

### - Reset ALARM

Resets an eventually alarm from the servo amplifier.

Red light means there is an alarm in the system. See the error display below for the error code.

### - Prev

Returns to the Setup menu.

### - Servo ON/OFF

Turns the servo motor and amplifier on or off.

**- Write to flash**

Used for initial servo setup.

## 5.5 SF2 Unit - Messages in operating panel

**- Ready**

The Staple and Fold unit's ready, and the signal tower will show the green light.

**- Paused**

The Staple and Fold unit's paused. This can happen for two reasons.

- User selects pause on the main menu. The signal tower will show the green light.
- A problem has appeared while the printer is running. Now the signal tower will show the red light. To continue, turn off the Pause either by open and close one of the hatches, or select 'Pause' on the main menu. Now the printer display changes to 'Press Continue to resume'. Push the 'Cont.' button to continue.

**- Lost sheet**

The vacuum arm has detected a lost sheet. The signal tower will show the red light.

To continue, open one of the hatches and place the sheet in the correct position manually. Close the hatch, the printer display changes to 'Press Continue to resume'. Push the 'Cont.' button to continue.

**- Replace Paper roll**

The paper roll needs to be replaced soon. The signal tower will show the yellow light flashing.

The actual roll diameter that will start this alarm can be set by the user.

Note! The printer will not stop, this is just a reminder to make you keep an eye on the paper roll.

**- Servo alarm**

Vacuum arms horizontal movement is malfunctioning in some way. The signal tower will show the red and green light flashing. The system needs a restart. Turn off the power, find the reason for the error and turn the power back on.

**- Book eject**

The finished stapled and folded book did not fall down. The signal tower will show the red light. When a book is finished, a sensor must register the book falling down within a certain period of time. If it does not fall down, the book might be stuck in the hatch opening. To correct the problem, slide the book over the sensor and open and close one of the hatches.

Now the printer display changes to 'Press Continue to resume'. Push the 'Cont.' button to continue.

## 5.6 SF2 Unit - Signal tower

In addition to the messages in the display, the signal tower will also indicate the different states.

### - Green light

Normal condition, everything is OK.

### - Green flashing light

The machine has received a print job and is adjusting for the sheet size in use.

### - Yellow light

One or both of the hatches are open.

### - Yellow flashing light

The paper roll needs replacement soon.

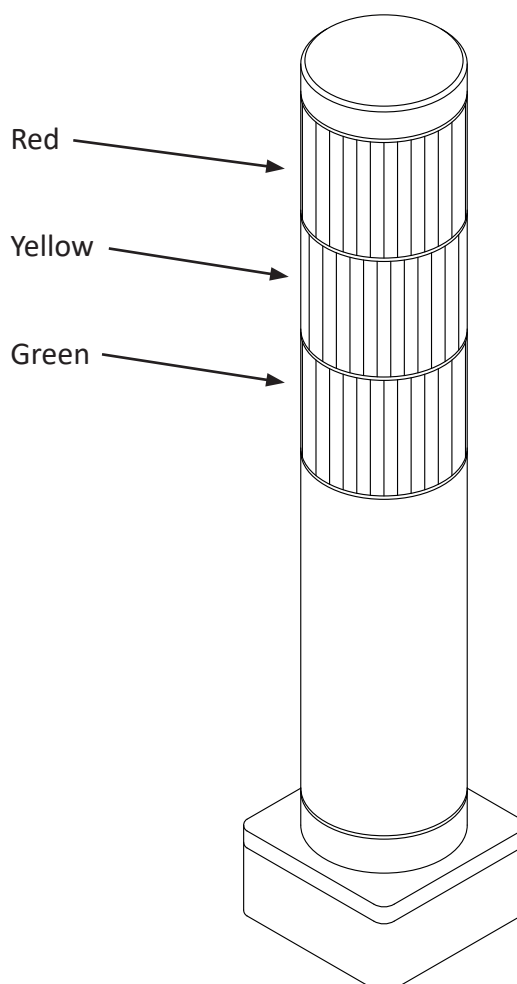
### - Red light

Can be caused by several reasons.

- The vacuum arm has lost a sheet.
- The book has not been ejected correctly.
- The hatches are opened while the printer is running.

### - Red and green flashing light

Servo alarm, vacuum arms horizontal movement is malfunctioning

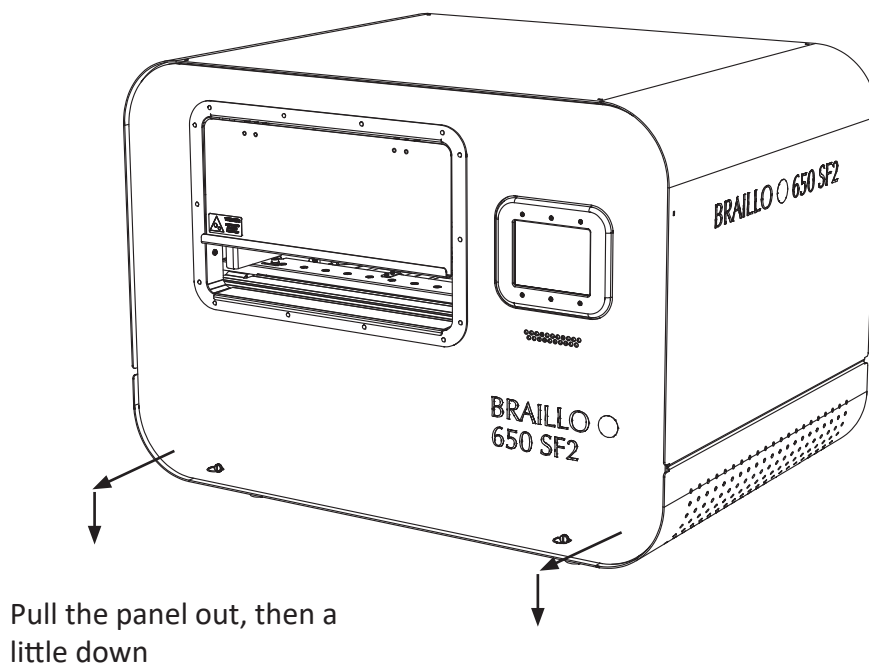
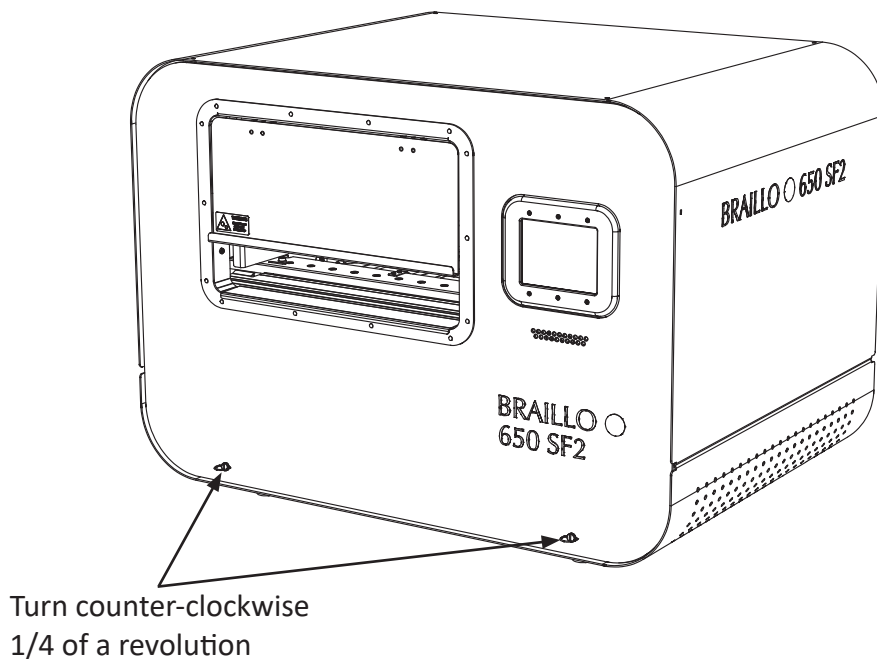


## 6. SERVICE AND MAINTENANCE

When doing some lighter service or maintenance tasks, it can be enough to remove the side plates on the cover. But for bigger operations we recommend to also remove the top cover. Please see section [6.2 'Removal of the printer top' on page 81](#) on how to do this.

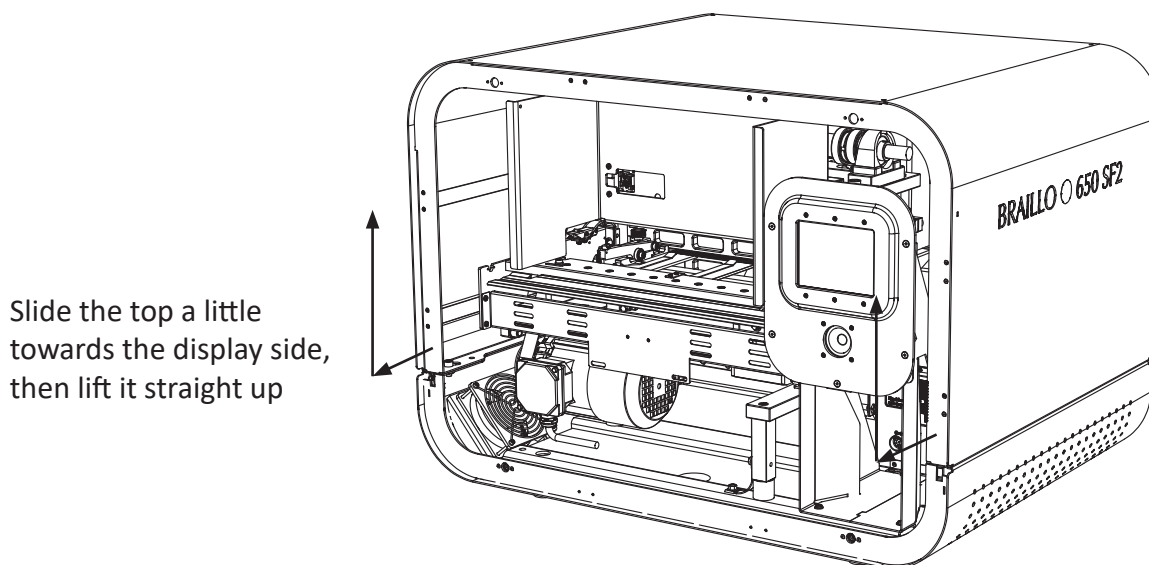
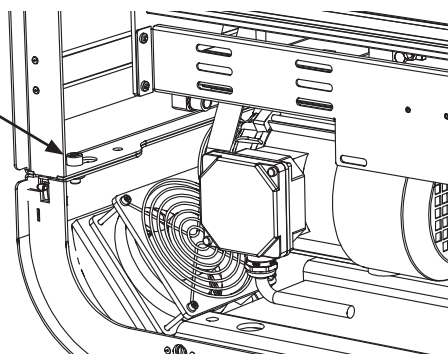
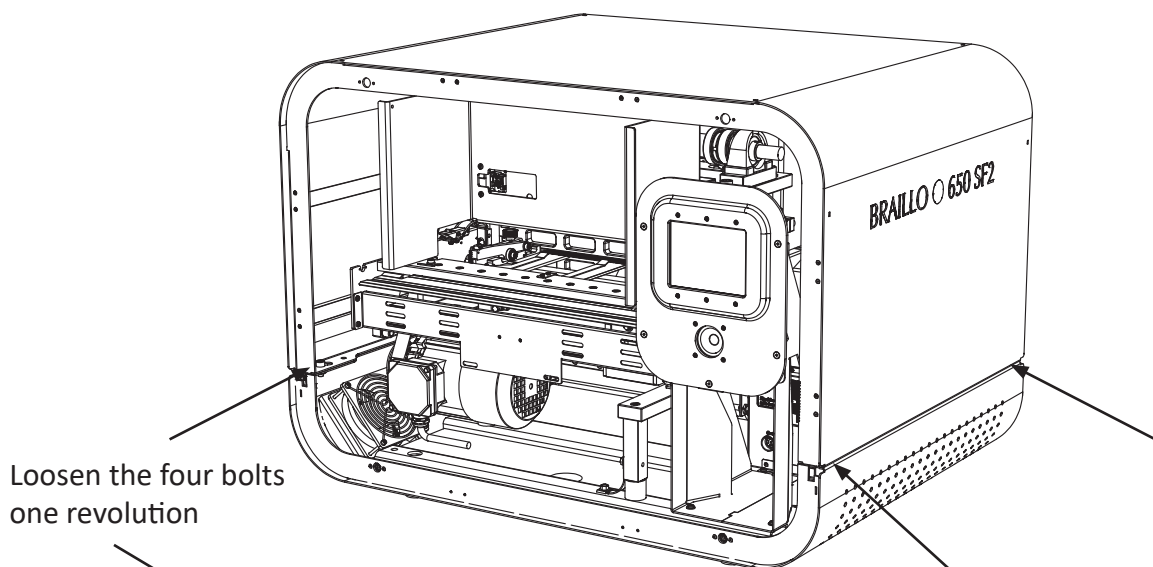
### 6.1 Removal of the printer side panels

The printer side panels can be removed by turning the quarter revolution fasteners counter-clockwise.



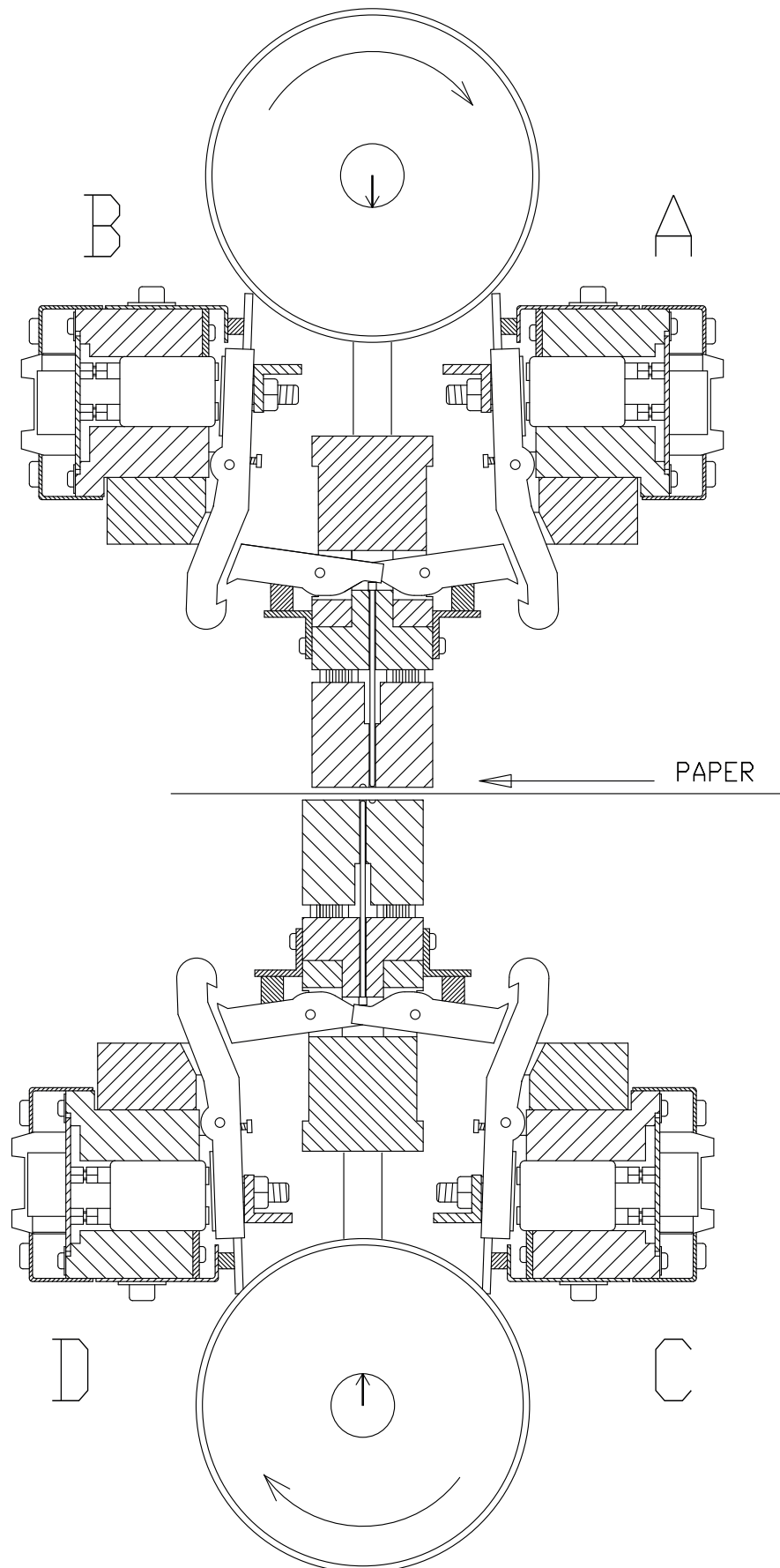
## 6.2 Removal of the printer top

If you are going to do maintenance, it can be more convenient to remove the top. Remove both side panels as described in section [6.1 'Removal of the printer side panels' on page 80](#). Loose the four bolts one revolution, then slide the top a little towards the operating panel side. Then lift it straight up.





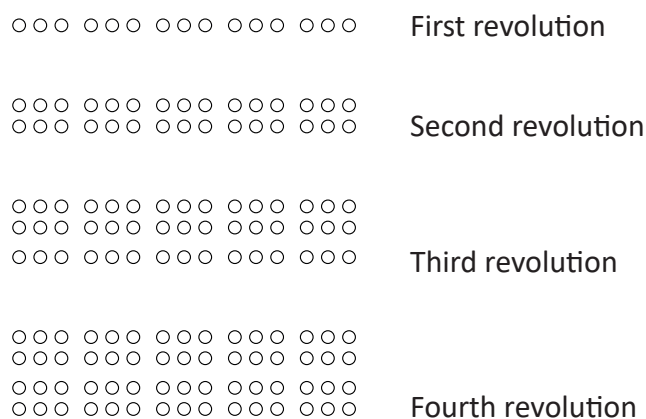
The figure below is a “theoretical” figure showing the parts inside the printing mechanism. The printer has been “sliced” to show more detailed of how it’s constructed.



Please see the figure on the previous page.

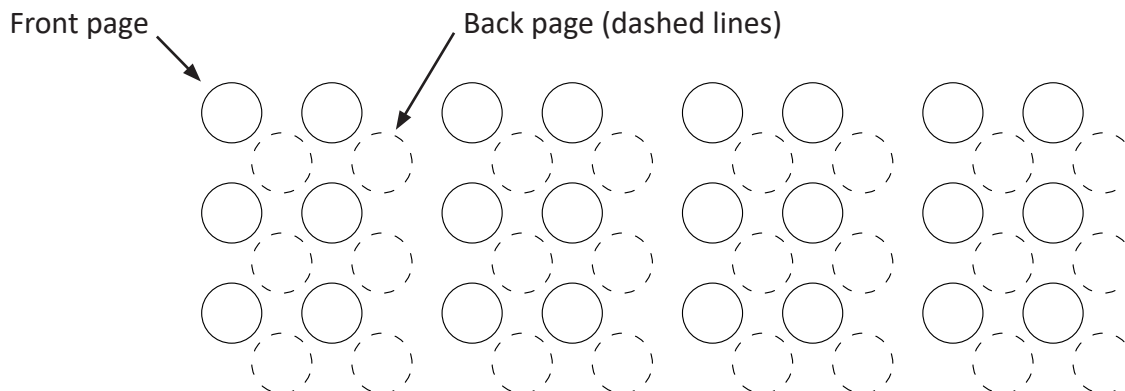
The two shafts, one at the top and one at the bottom, are rotating synchronized. On each shaft there are eccentrics that are moving the beams and paper shoes up and down. This movement is used both to hold the paper and to make the dots. A row of dots is printed for each revolution of the shafts. The shafts must rotate two times to form a complete column of characters.

Please see figure below.



To be able to print interpoint (where both sides of paper are printed simultaneously), the back page is offset a little to the right and a little down to fit in between the dots on the front page.

Please see figure below.





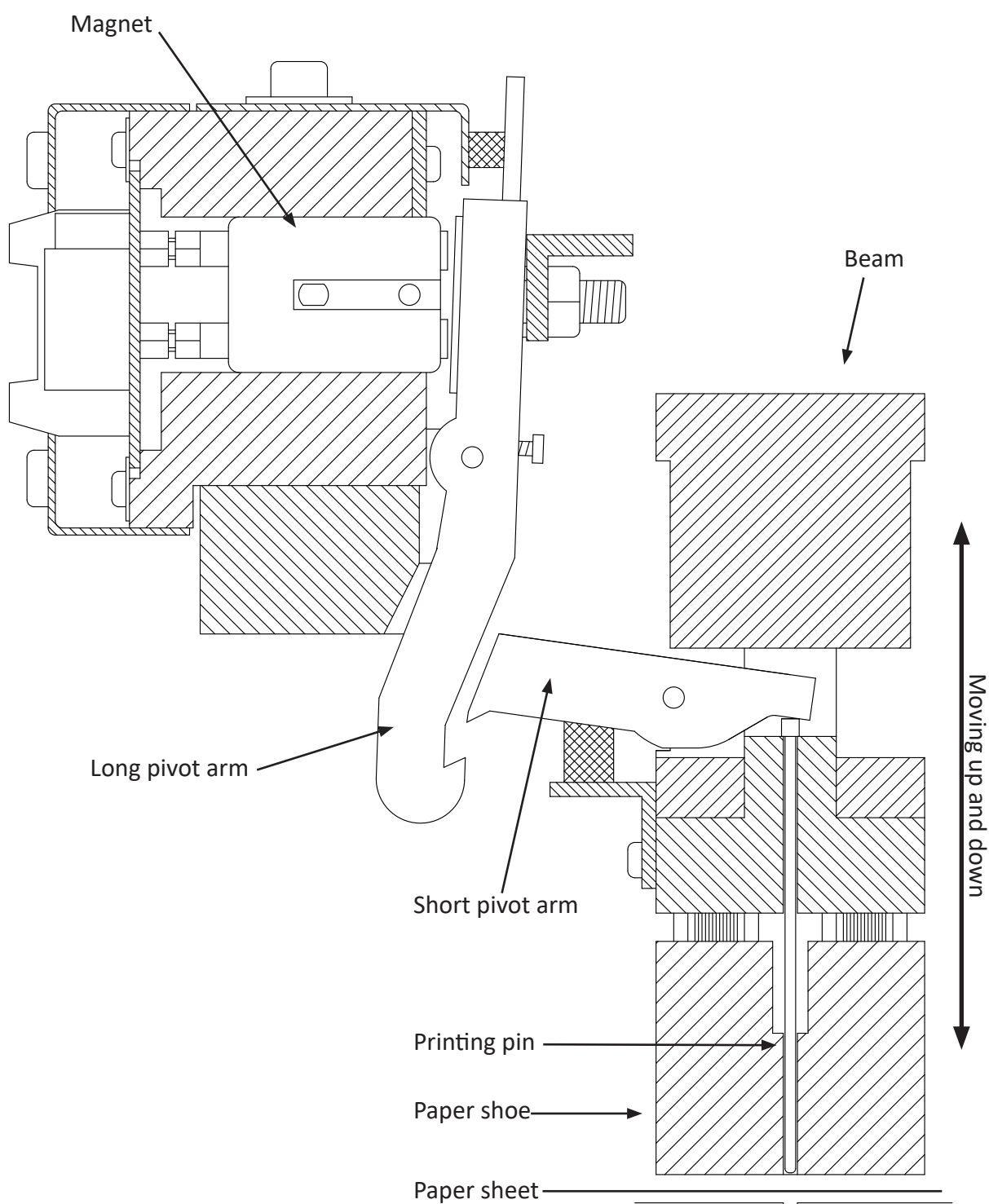
The drawing on this page is meant to help to understand the basic principle of how the dots are printed. Please also see the drawings on the next page.

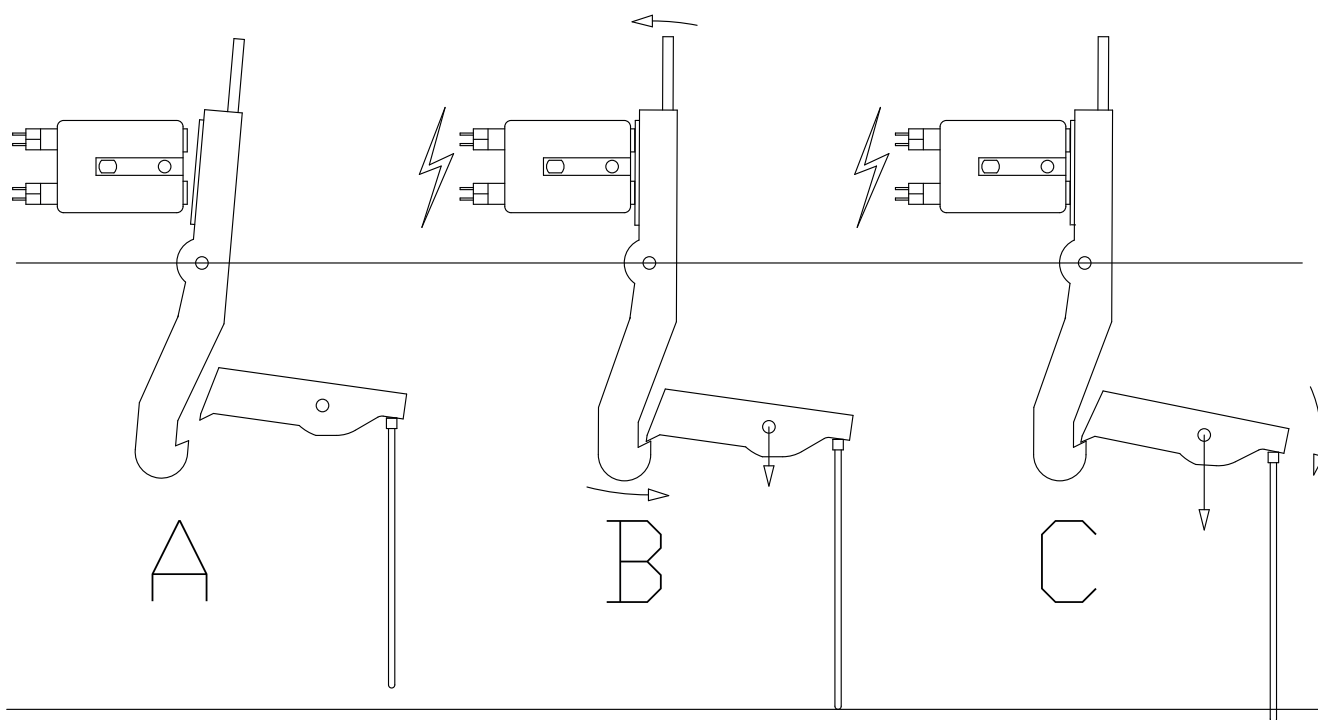
The parts in the upper left of this drawing is one of the magnet racks. The parts in the lower right, are the beam and paper shoes. The magnet racks itself do not move, but the beams and the paper shoes are moving up and down for every revolution of the eccentric shafts.

Inside each magnet rack there are 45 electrical magnets. The magnets are controlling the long pivot arms.

When a dot is going to be printed, the magnet is engaged, and the long pivot arm will be drawn against the magnet poles.

At the same time, the beam and the paper shoe will start to move downwards, and the short pivot arm will catch the hook of the long pivot arm. The beam will continue to travel downwards, and will force the printing pin into the paper.





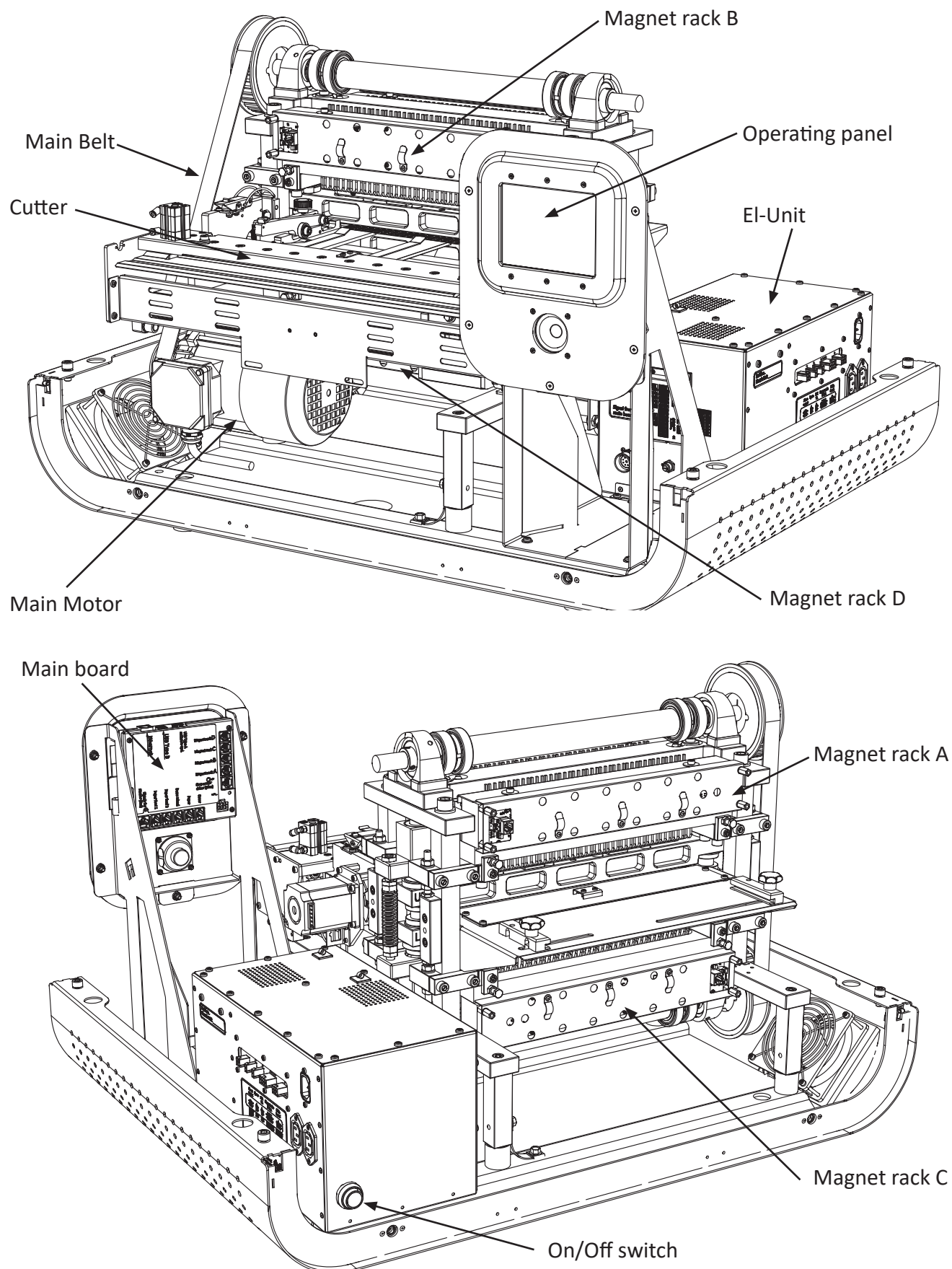
**Figure A**  
Shows the position on the pivot arm when the printer is not printing, and the magnet is not engaged.

**Figure B**  
Now the magnet is engaged, and the long pivot arm has been pulled against the magnet. The short pivot arm is moving down towards the hook on the long pivot arm.

**Figure C**  
The long pivot arm's hook catch the short pivot arm. As the short pivot arm moves further down, the printing pin will be forced down into the paper and make the dot.

## General overview

(Protection covers are removed)



## 6.4 Troubleshooting, incorrect braille

If any errors have been found in some of the characters in the printed text during proofreading, the first thing to do is:

Check the characters in the text-file in the computer to find out if the error could come from the text-file and not from the printer.

If your text-file is OK, the problem is caused by the printer.

The errors could be caused by either an electrical or a mechanical problem. On the electrical side, there is integrated a self-diagnostic system that is continuously checking the magnets during printing, and will trig an alarm if it detects some electrical problems with the magnets.

So, if no alarm is triggered, the errors found are most likely caused by some faulty mechanical parts or maybe dirt clogging the moving mechanisms.

Inside the printer there are four identical magnet racks, named from A to D. Each magnet rack contains 45 printing mechanisms. There are totally 180 printing mechanisms to choose from when the error search begins. See section [‘Which magnet makes what dot?’ on page 90](#) for more information.

If the printer has been printing a lot (a lot could be after a year, or after 1000 printing hours, depending on what comes first) errors in the characters could occur. If this happens, it could just be that the printer needs regular maintenance. See section [6.9 ‘Magnet rack - cleaning’ on page 100](#), and section [6.30 ‘Maintenance’ on page 129](#).

As a start, you should run the built-in Test Print. Depending on what kind of errors you have, you should use different tests.

The essential thing at this stage is to find which magnet rack is causing the trouble.

If there is missing dot(s), use the X pattern to detect which magnet rack is missing the dot(s).

If there are too many dots, use the full cell lines, or the test pattern on test print no. 4, and the extra dot(s) will appear in the space between the lines.

However, the best test is ordinary text, if a proofreader is available. To locate the faulty magnet rack(s), see figures and the table in section [‘Which magnet makes what dot?’ on page 90](#).

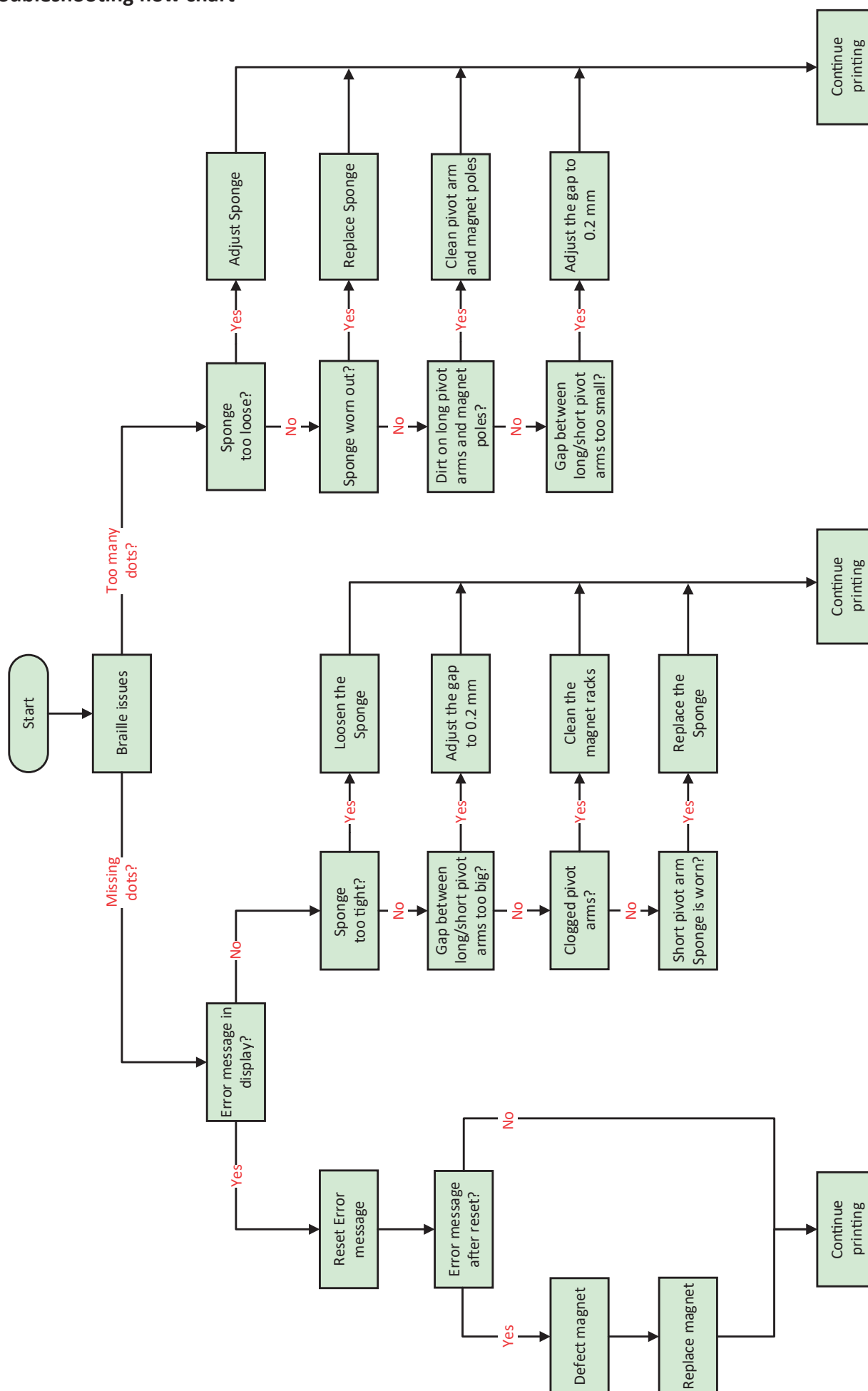
To confirm that you have found the correct magnet rack, you can test the magnet racks with the function ‘X pattern without motor’ found in the ‘Manual running’ menu (*Main Menu - Warning - Service/diagnostic - Warning - Manual running*). This function will run the magnets one by one sequentially without running the rest of the printer mechanism.

If a pivot arm does not move properly like the other pivot arms, it could e.g. be that the pivot arm is clogged, or that the sponge list is pushing too hard. If the suspected pivot arm is moving like the rest of the pivot arms, the problem might be within the short pivot arm/printing pin mechanism or with the position of the magnet rack itself.

To verify that you have found the correct pivot arm/magnet mechanism, it’s possible to manually pull the long pivot arm against the magnet with your finger while the printer is embossing.

A column of dots will then appear, and if the column is situated exactly on the same position as the error was in the first place, you have found the correct one.

# Troubleshooting flow chart



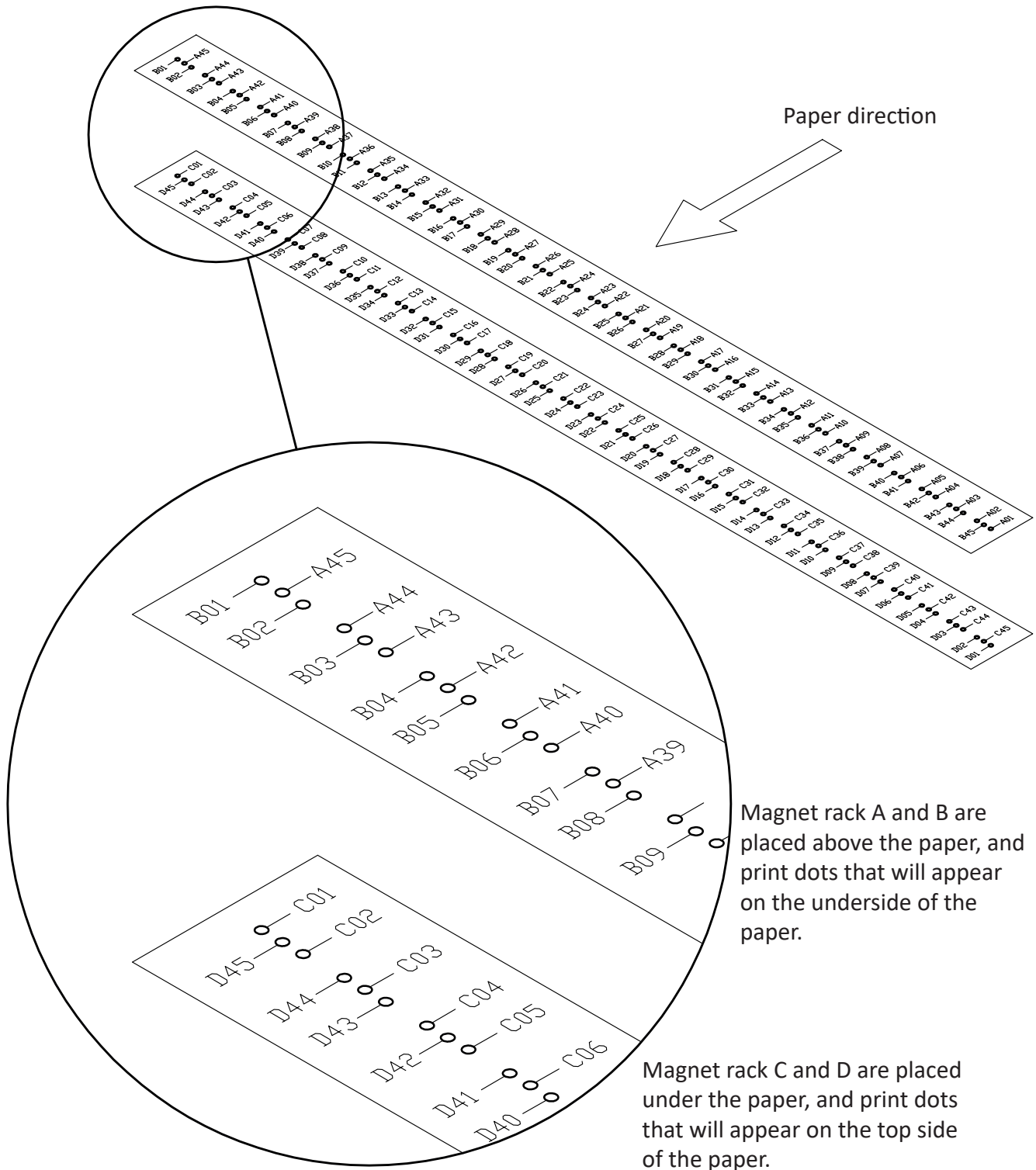
## Which magnet makes what dot?

Please take some time to examine the figures below and on the next page. It's very important that you know how the magnets are arranged to be able to understand how this printer works.

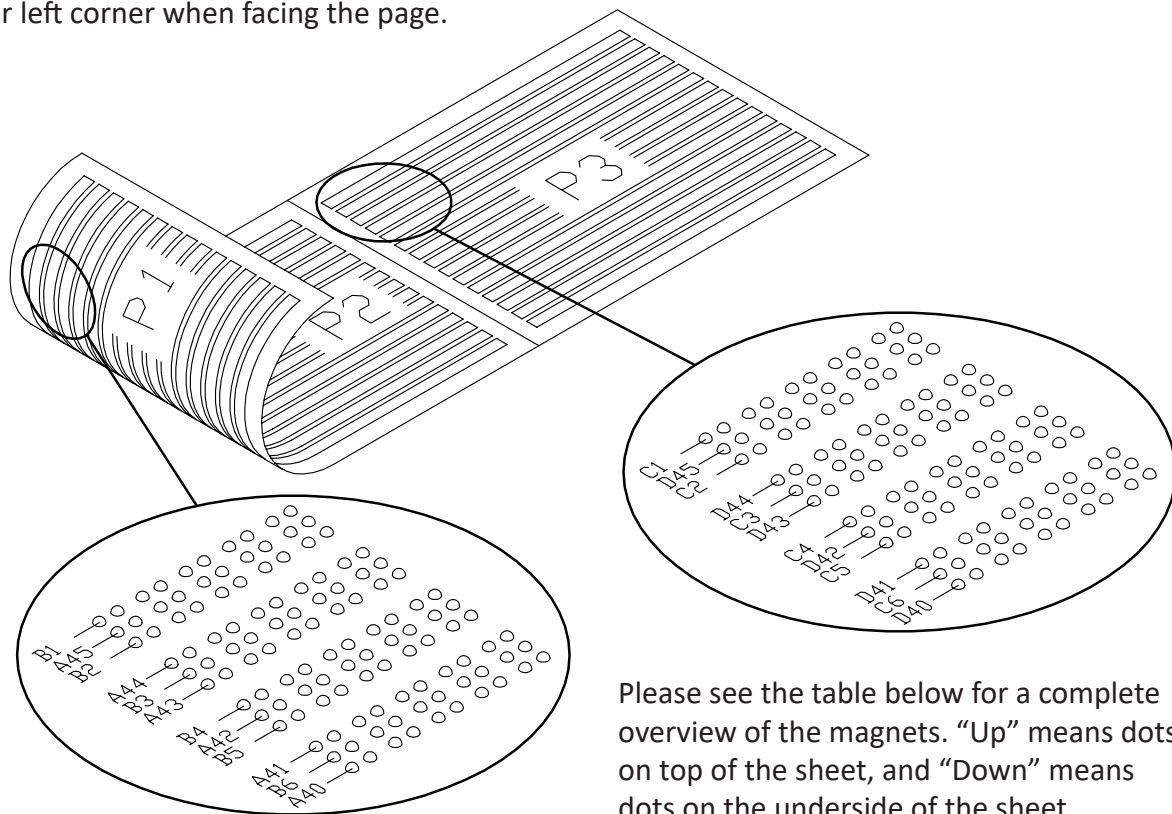
The letters and numbers on the figures is indicating the following:

The letters A, B, C and D are the names of the magnet racks. The number following the letter is the particular magnets number in that particular magnet rack.

(Note that the magnet numbers are always counted from the end where the connectors are fitted. Don't mix this with character/line/column number).



The letter “P” means page. The figure shows a sheet of paper printed in “4-page mode”. The two circles are showing which magnet that has made the different dots. Line no. one will be in the upper left corner when facing the page.



Please see the table below for a complete overview of the magnets. “Up” means dots on top of the sheet, and “Down” means dots on the underside of the sheet.

Line no.	Dot no.	Up	Down	Line no.	Dot no.	Up	Down	Line no.	Dot no.	Up	Down
1	1	C01	B01	11	1	C16	B16	21	1	C31	B31
	2	D45	A45		2	D30	A30		2	D15	A15
	3	C02	B02		3	C17	B17		3	C32	B32
2	1	D44	A44	12	1	D29	A29	22	1	D14	A14
	2	C03	B03		2	C18	B18		2	C33	B33
	3	D43	A43		3	D28	A28		3	D13	A13
3	1	C04	B04	13	1	C19	B19	23	1	C34	B34
	2	D42	A42		2	D27	A27		2	D12	A12
	3	C05	B05		3	C20	B20		3	C35	B35
4	1	D41	A41	14	1	D26	A26	24	1	D11	A11
	2	C06	B06		2	C21	B21		2	C36	B36
	3	D40	A40		3	D25	A25		3	D10	A10
5	1	C07	B07	15	1	C22	B22	25	1	C37	B37
	2	D39	A39		2	D24	A24		2	D09	A09
	3	C08	B08		3	C23	B23		3	C38	B38
6	1	D38	A38	16	1	D23	A23	26	1	D08	A08
	2	C09	B09		2	C24	B24		2	C39	B39
	3	D37	A37		3	D22	A22		3	D07	A07
7	1	C10	B10	17	1	C25	B25	27	1	C40	B40
	2	D36	A36		2	D21	A21		2	D06	A06
	3	C11	B11		3	C26	B26		3	C41	B41
8	1	D35	A35	18	1	D20	A20	28	1	D05	A05
	2	C12	B12		2	C27	B27		2	C42	B42
	3	D34	A34		3	D19	A19		3	D04	A04
9	1	C13	B13	19	1	C28	B28	29	1	C43	B43
	2	D33	A33		2	D18	A18		2	D03	A03
	3	C14	B14		3	C29	B29		3	C44	B44
10	1	D32	A32	20	1	D17	A17	30	1	D02	A02
	2	C15	B15		2	C30	B30		2	C45	B45
	3	D31	A31		3	D16	A16		3	D01	A01

**Possible reasons for errors:**

See figures on the next page.

If a dot from a certain printing pin is missing regularly, the reason might be one of the following:

1. Defect magnet (the self-diagnostic system should find this one first).
2. Broken short pivot arm.
3. The long pivot arm cannot move because of dirt.
4. The printing pin is stuck because of dirt, causing the short pivot arm to miss the long pivot arm.
5. Errors in the magnet rack board.

If dots from several printing pins are missing now and then, the reason might be one of the following:

1. The sponge list is pushing too hard on the long pivot arm.
2. The gap between the two pivot arms is too large.
3. The support list has become sticky on the side against the long pivot arms, and the long pivot arm does not move properly.
4. The sponge list on the short pivot arm is so worn/compressed that it will not give enough tension on the pivot arm.

If there are too many dots on the paper, the reason might be one of the following:

1. The sponge list is not pressing enough against the long pivot arm.
2. The gap between the two pivot arms is too small.
3. The magnet poles have become sticky, and this causes the pivot arms to stick to the magnet.
4. The long pivot arm does not move properly.

**Control:**

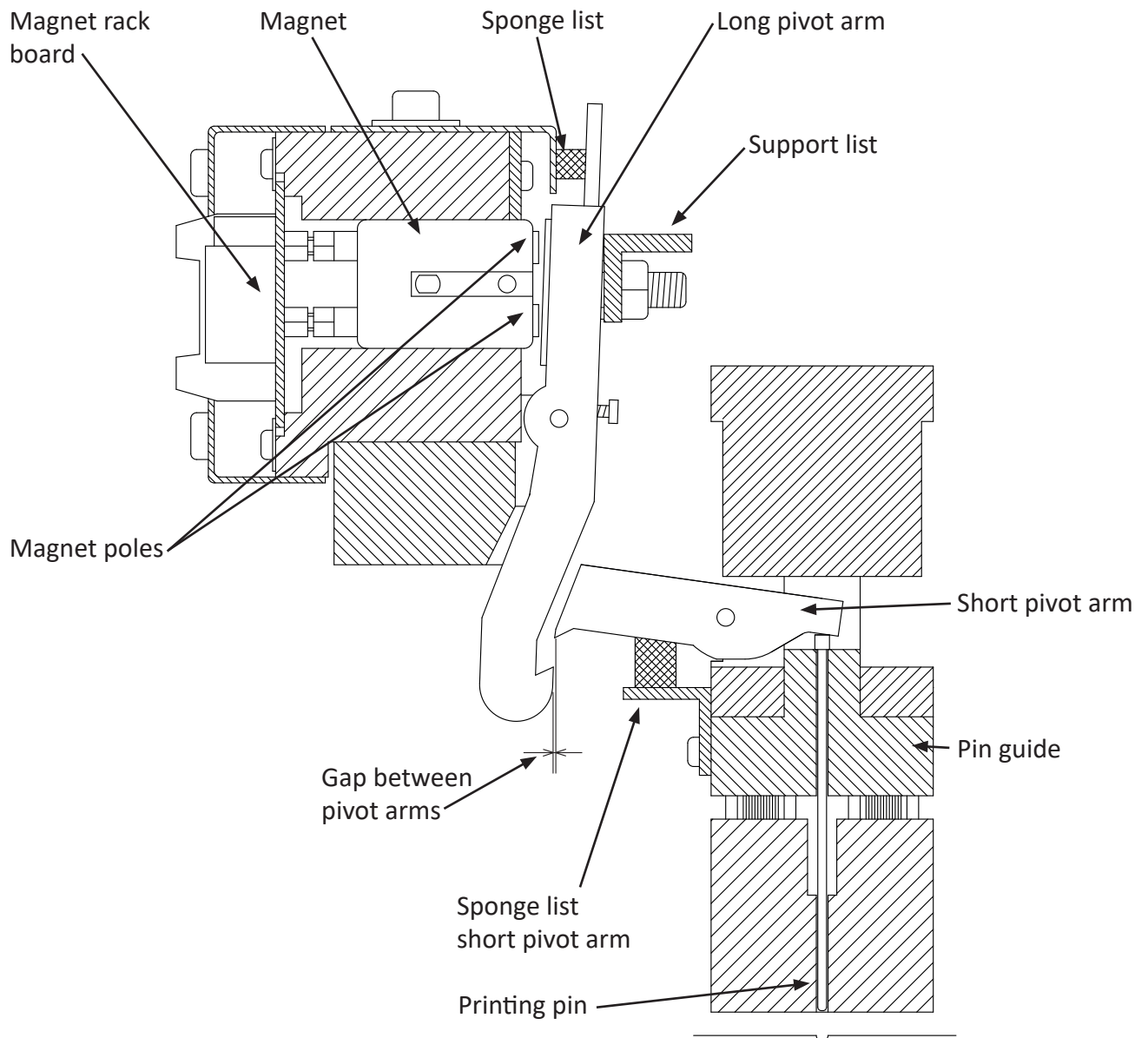
To be sure that you have found the right mechanism after the troubleshooting, you can do the following test: Pull carefully the suspected long pivot arm against the magnet with your finger.

Note! Please be careful to avoid getting in contact (e.g. clothes, hair, beard, jewellery or any part of the body) with any other moving parts of the printer to prevent personal injuries!

At the same time, run a test print. The mechanism with the finger on, will make a column of dots downwards the sheet until you take the finger away. By doing this you can see if this column of dots is situated on the same place (and same side!) of the sheet as the error is.

Observe that the same printing mechanism (magnet, long pivot arm, short pivot arm and printing pin) makes all the dots in a column downwards the page.





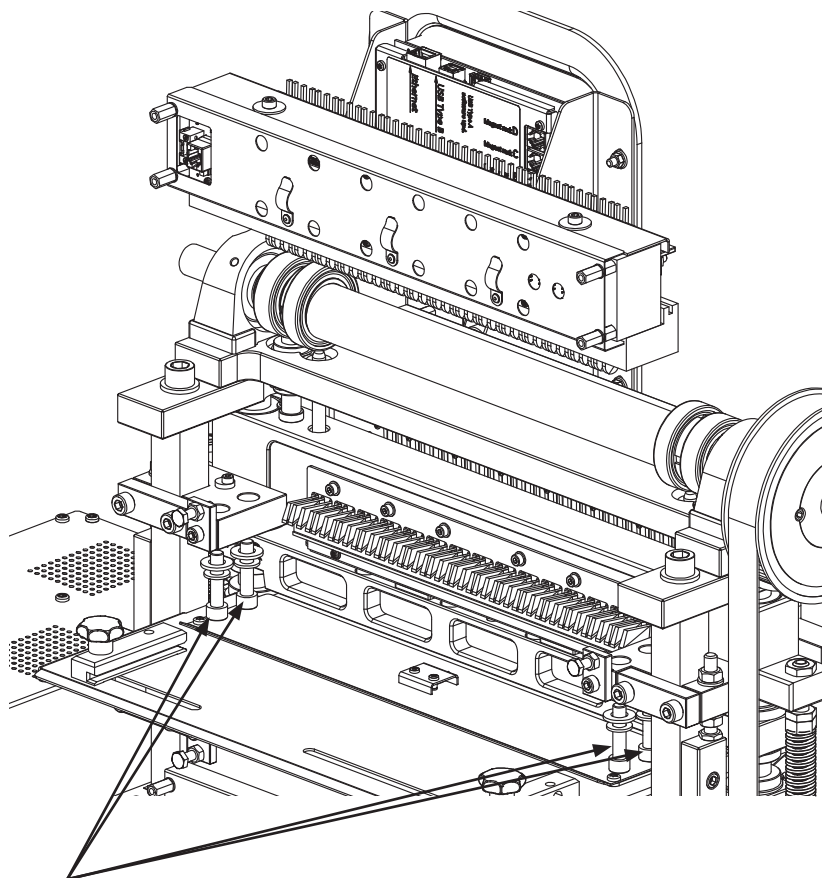
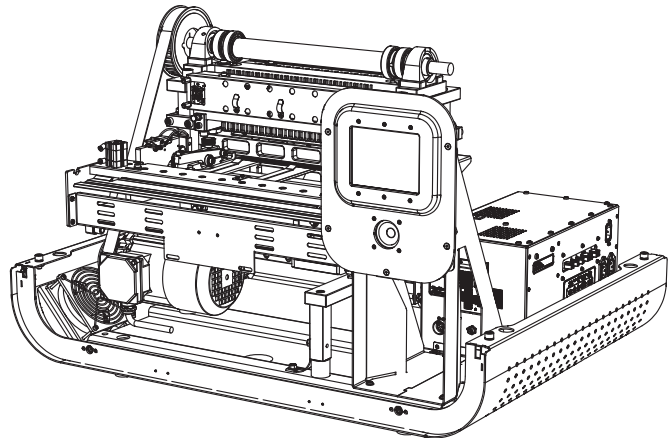
## 6.5 Magnet rack - removal

Please see figure below.

Disconnect the two cables for the magnet rack. Remove the magnet rack by unscrewing the four screws like shown in the figure.

It can be convenient to remove the input paper guide and the paper feed tractor first to get more space.

See section [6.20 'Paper feed and cutter assembly - removing'](#) on page 118 and section [6.23 'Input paper guide - removing'](#) on page 121 for descriptions on how to remove them.

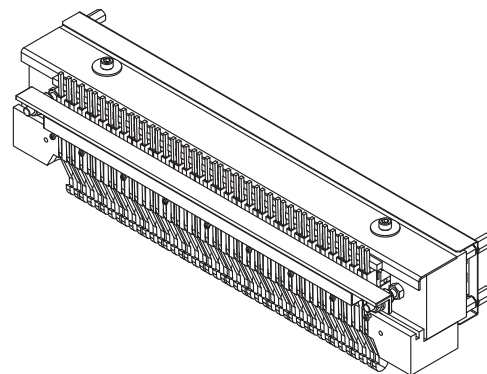


Unscrew the four bolts

## 6.6 Magnet rack - disassembly, step by step

There are two main reasons for disassembling the magnet rack. It could be to replace some parts, i.e. defect magnet or worn pivot arm, or it could be for regular maintenance.

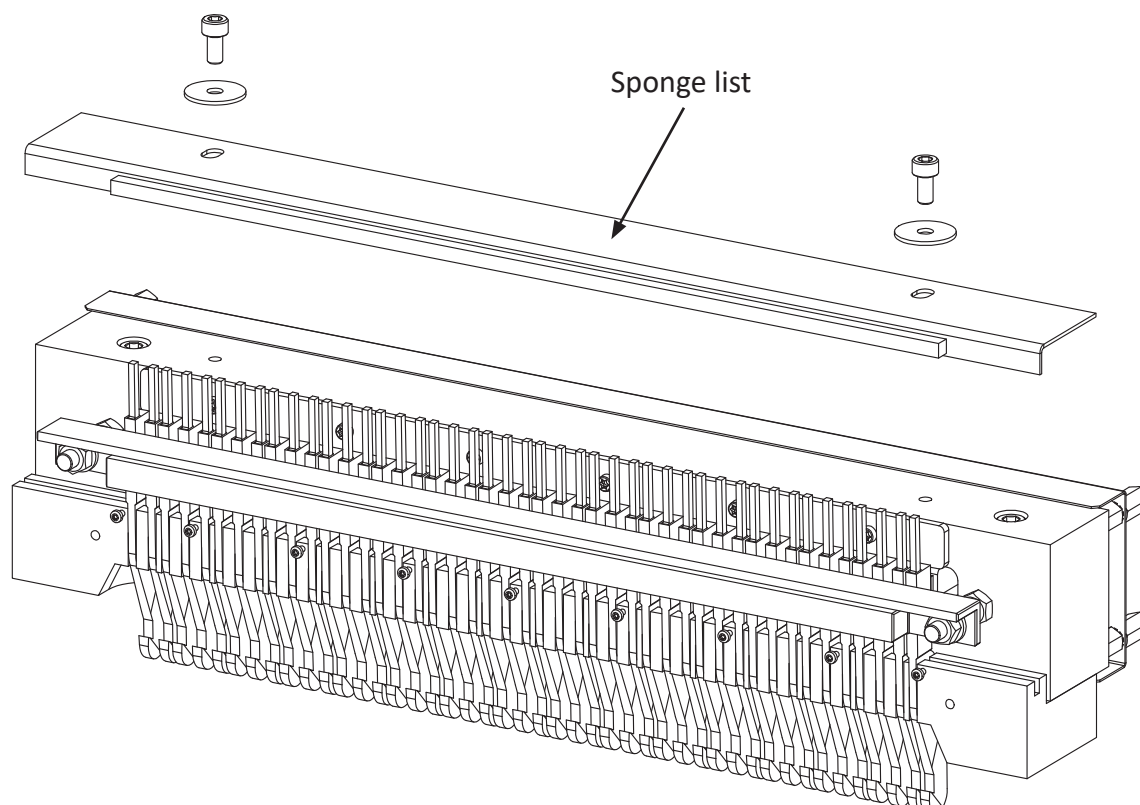
The magnet racks can be considered as the part of the printer that will have the greatest influence on the dot quality, so it's very important to know how to deal with them.



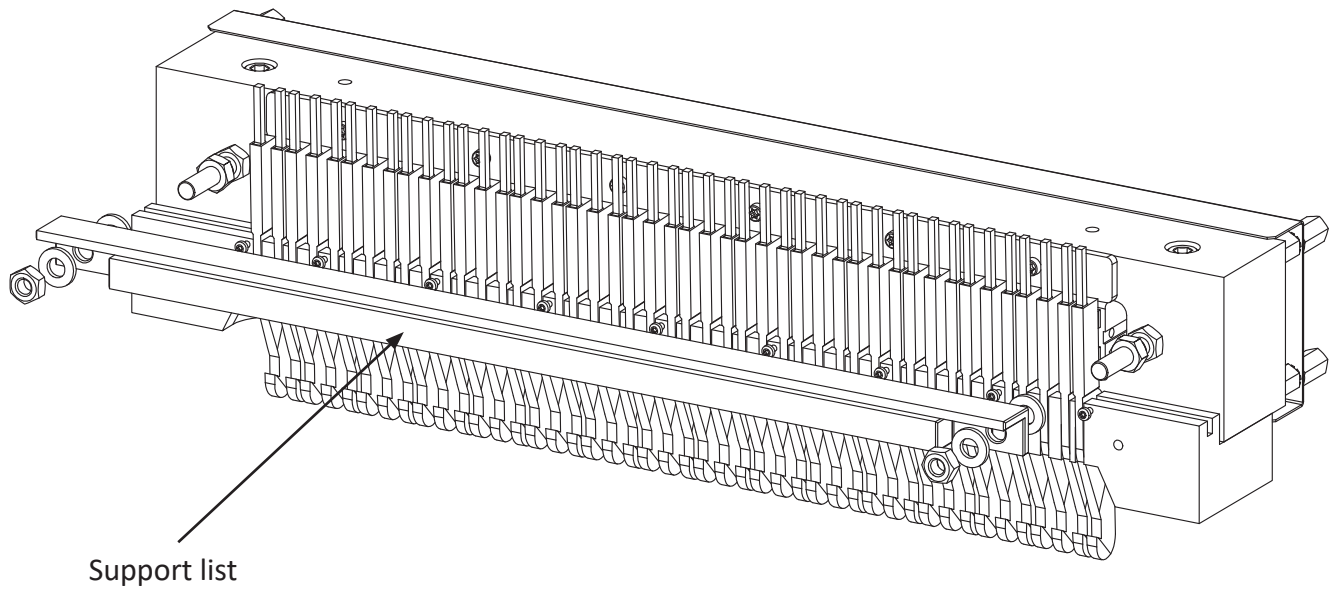
Take the magnet rack out of the printer like described in section [6.5 'Magnet rack - removal' on page 94](#).

Next, follow the instructions below.

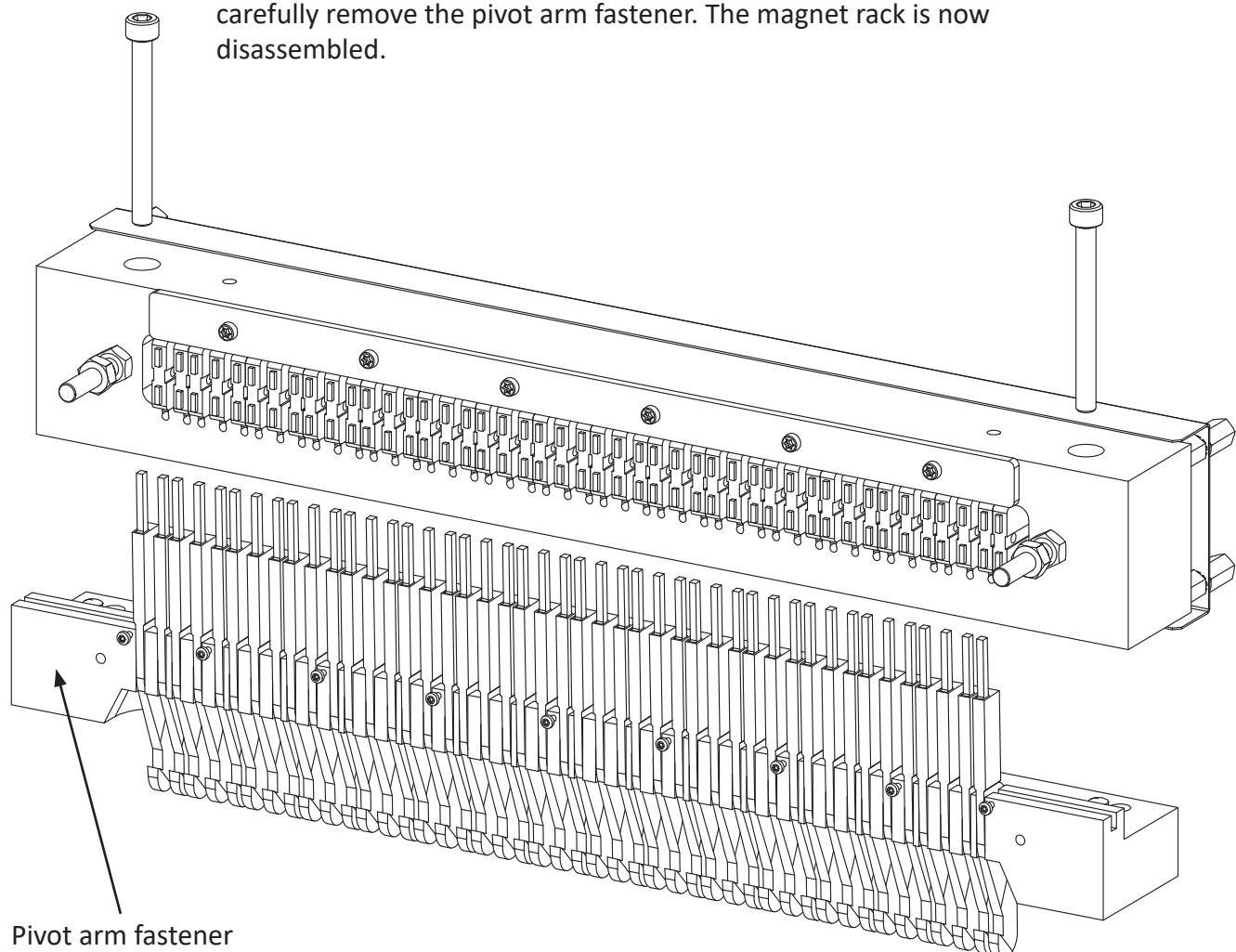
**Step 1.** Remove the two screws holding the sponge list, and remove the list.



Step 2. Remove the two nuts holding the support list, and then remove the support list.



Step 3. Remove the two bolts holding the pivot arm fastener and then carefully remove the pivot arm fastener. The magnet rack is now disassembled.



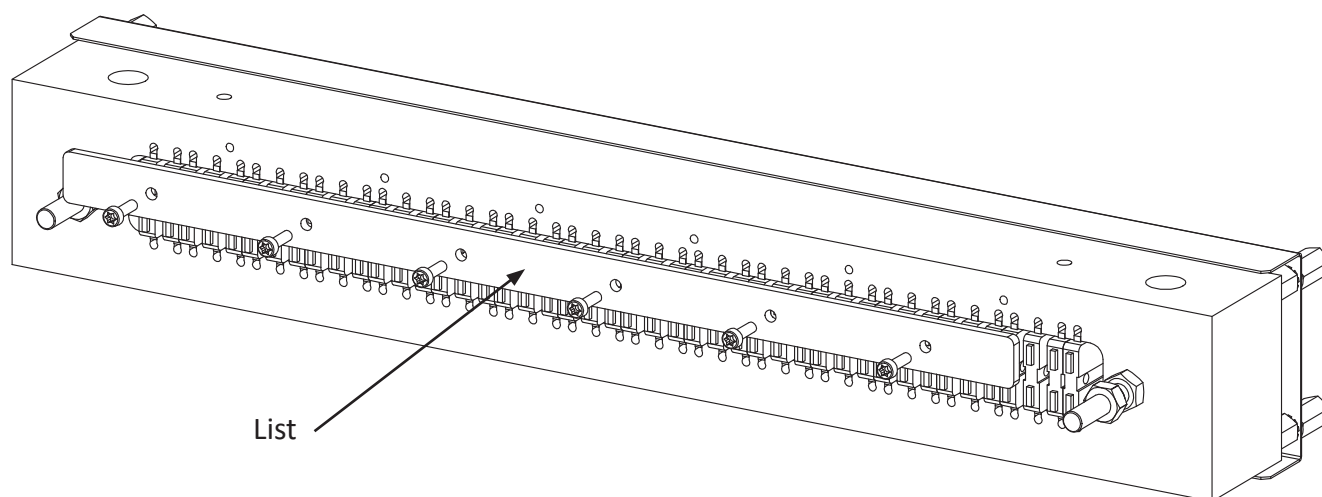
## 6.7 Magnet - replacement

Please observe that the numbering on the magnets in a magnet rack, always starts at “one” at the end where the connections are. (It does not refer to dot number, character number or column number!).

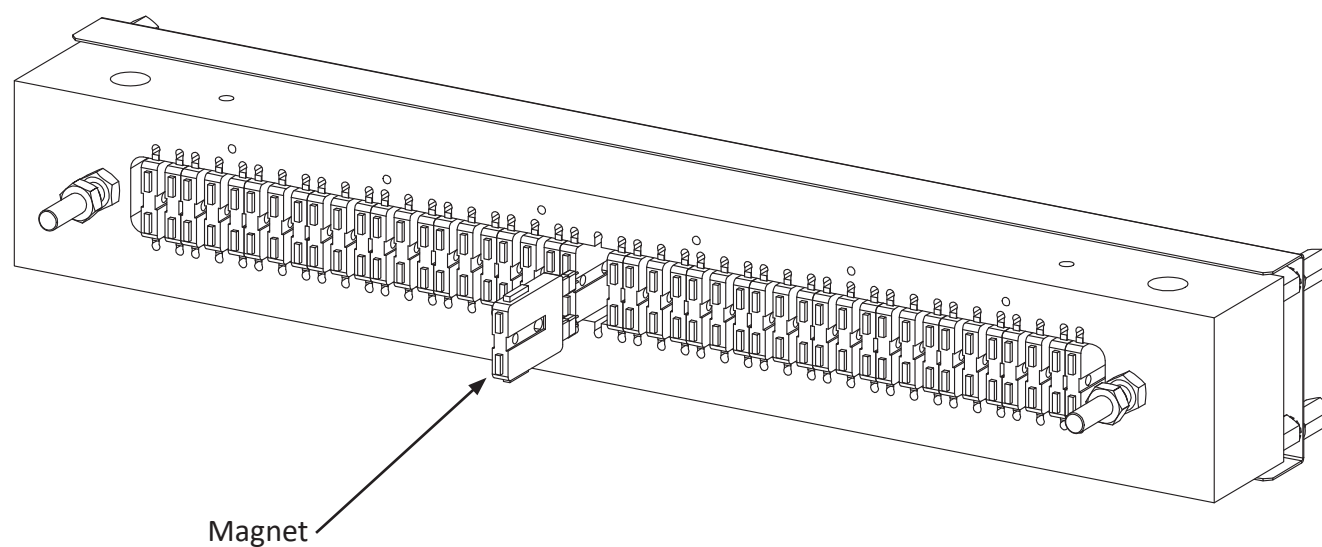
Disassemble the magnet rack like described in section [6.6 ‘Magnet rack - disassembly, step by step’ on page 95](#).

Next, follow the instructions below.

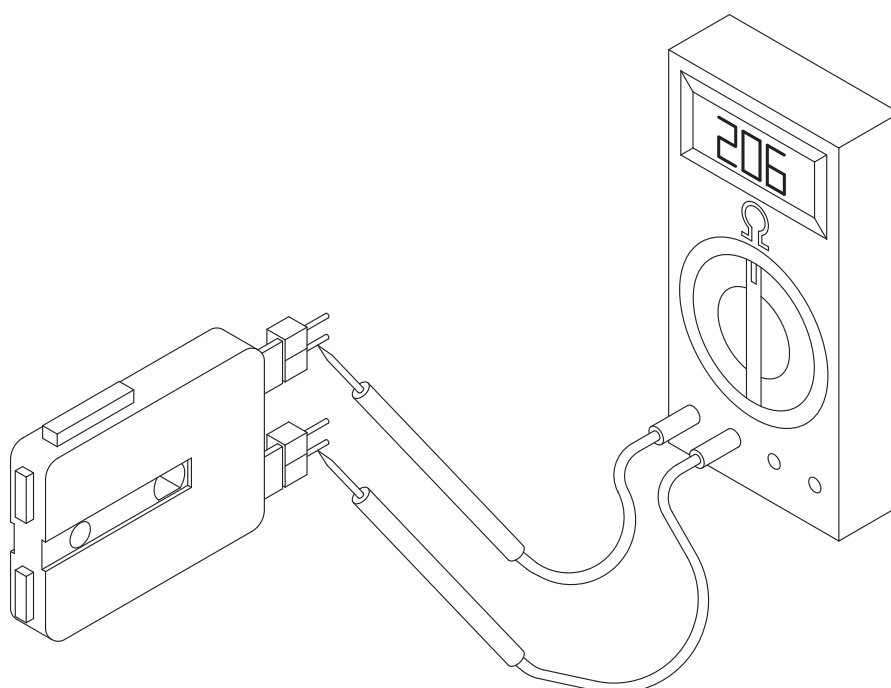
**Step 1.** Remove the five screws holding the list, and the list.



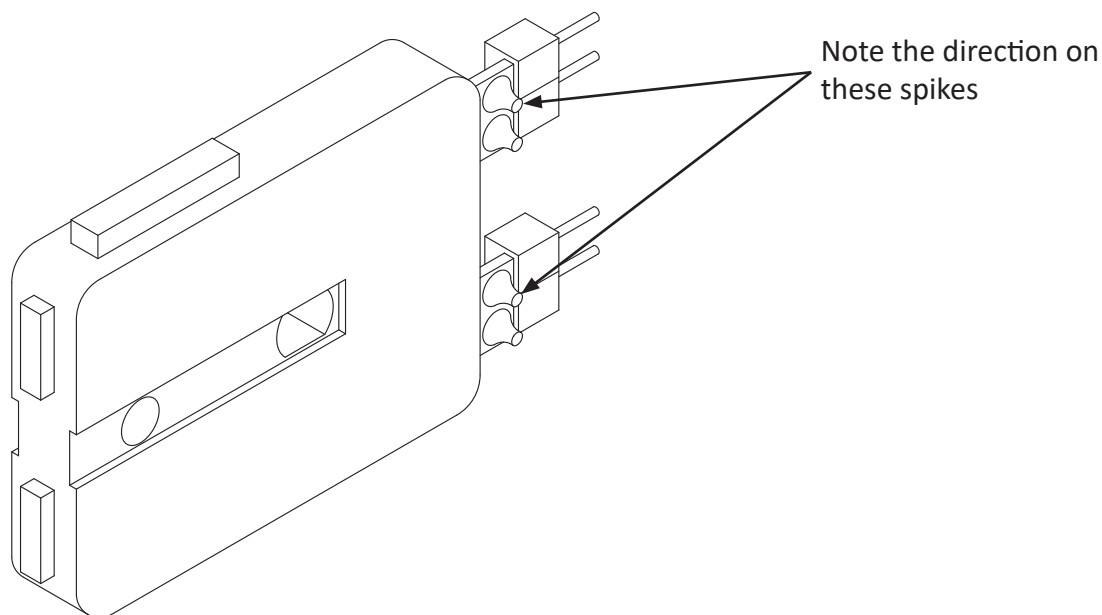
Step 2. Pull out the defect magnet with, e.g. a narrow needle nose pliers.



Step 3. Check the magnets internal resistance if you have an ohm-meter available. The resistance should be from 185 ohm to 240 ohm. Any value outside this range indicates a defect magnet.



- Step 4. Replace the defective magnet with a new magnet. Note the spikes on one of the sides on the magnet. These spikes must be oriented the same direction as the rest of the spikes in the magnet rack.



## 6.8 Pivot arm - replacement

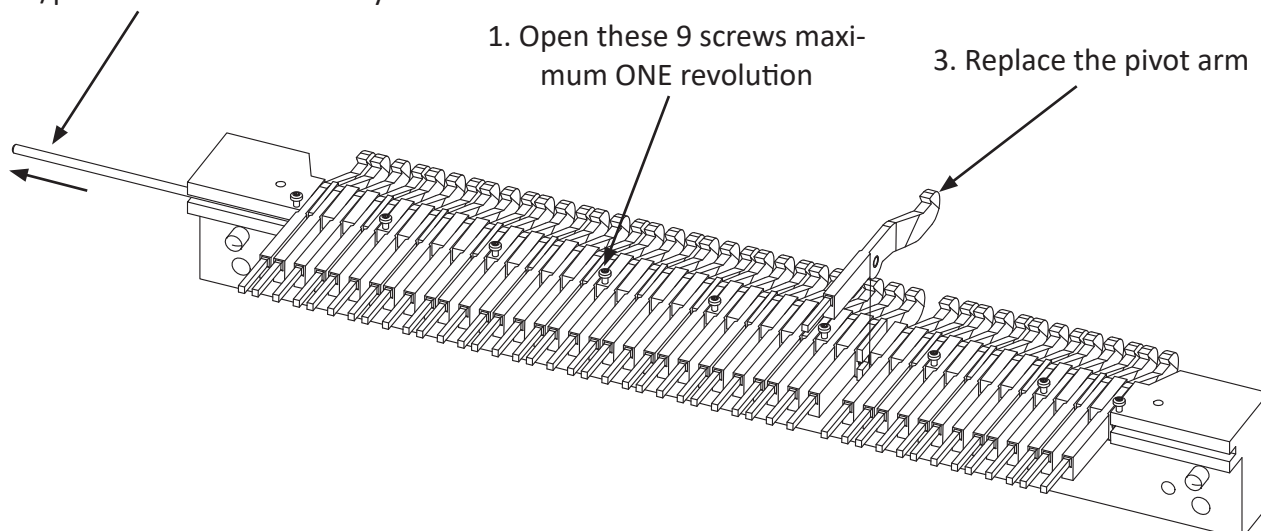
To take out or replace a pivot arm, you must first loosen the 9 small screws on the pivot arm fastener. Note! Only loosen these screw about one revolution, do not unscrew them completely!

When the screws are loose, the pivot arm shaft can be pushed out sideways.

Push/pull the shaft so the pivot arm you will replace becomes loose.

When assembling, position one and one pivot arm and at the same time push the shaft gradually in place. Tighten the 9 screws carefully again.

2. Push/pull the shaft out sideways



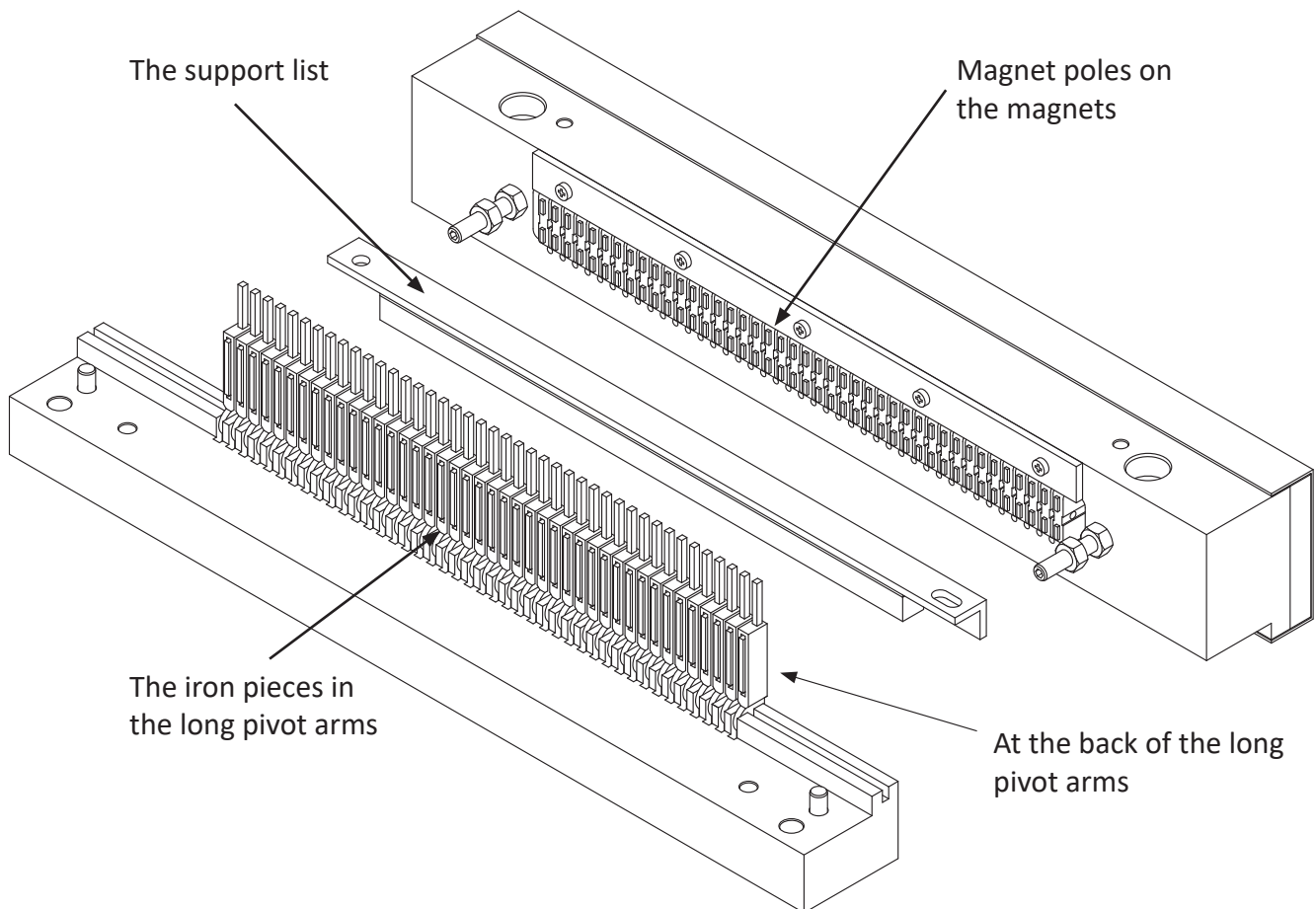
## 6.9 Magnet rack - cleaning

Remove the magnet rack as described in section [6.5 'Magnet rack - removal' on page 94](#). Then disassemble the magnet rack as described in section [6.6 'Magnet rack - disassembly, step by step' on page 95](#).

Now use a damp cloth moistened with cleaning alcohol to wipe off the surfaces as described in the figure below.



Note! Never oil, grease or lubricate any of the moving parts on a magnet rack! This will only attract paper dust and cause clogging.





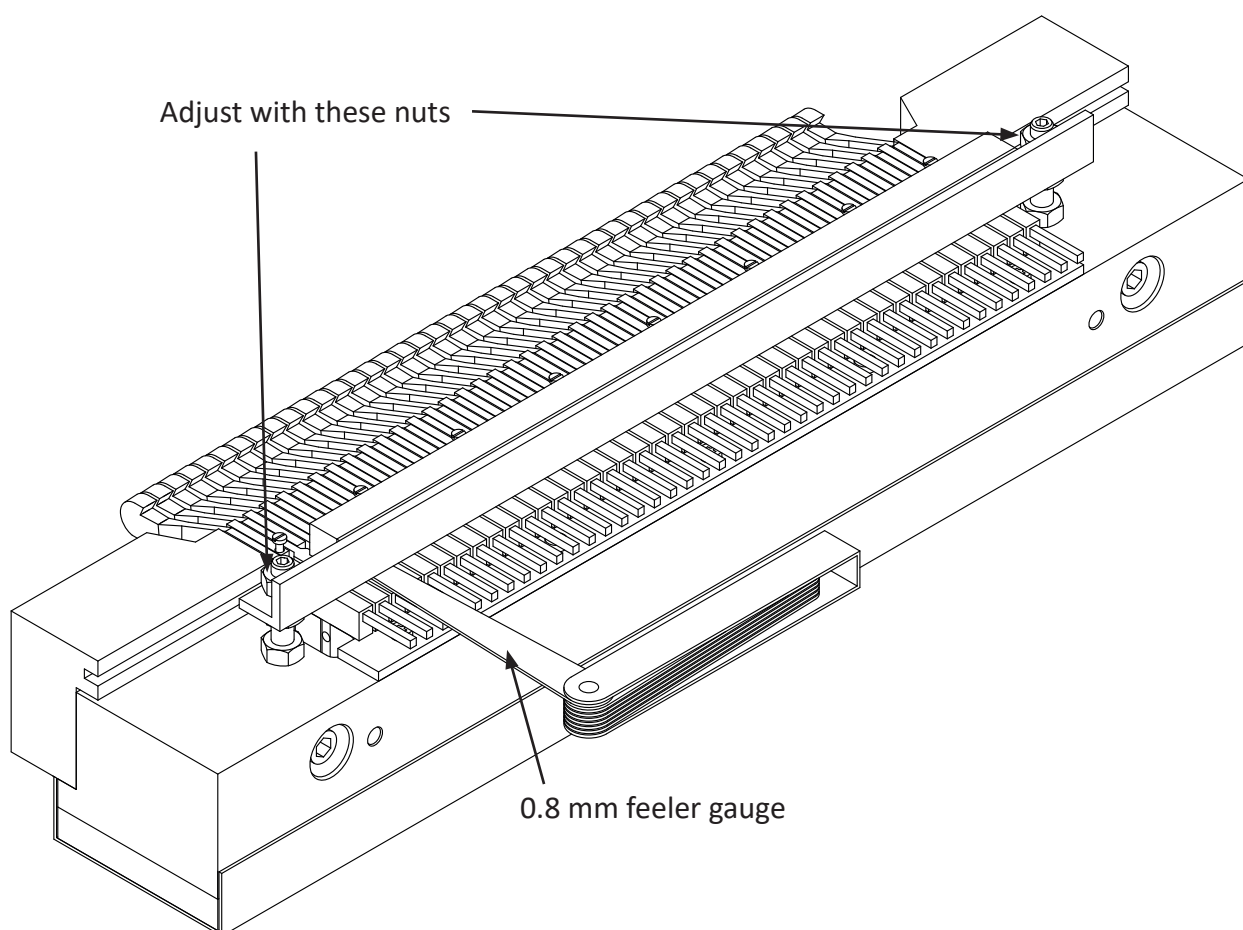
## 6.10 Magnet rack - adjustment

Before placing the magnet rack in the printer, two adjustments must be checked.

The first is the distance between the support list and the pivot arms. This is the travelling distance for the pivot arm. And it should be adjusted to about 0.8 mm using a feeler gauge. Adjust the nuts on both ends of the magnet rack.

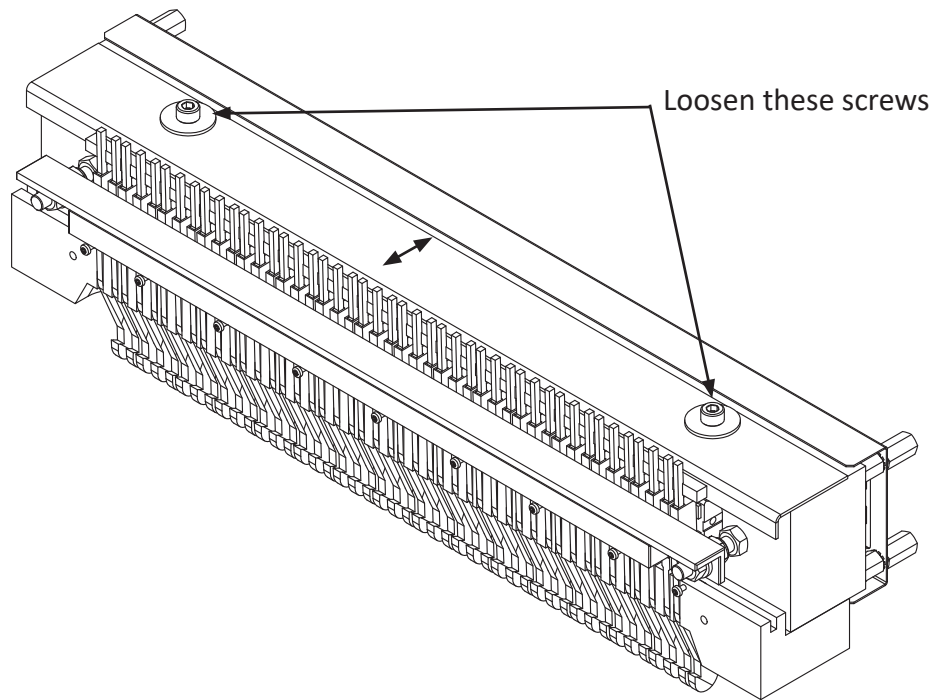
If the 0.8 mm feeler gauge goes half way in, and the 0.9 mm feeler gauge does not go in at all, consider the adjustment OK.

Make sure that the nuts are tight when you are done!



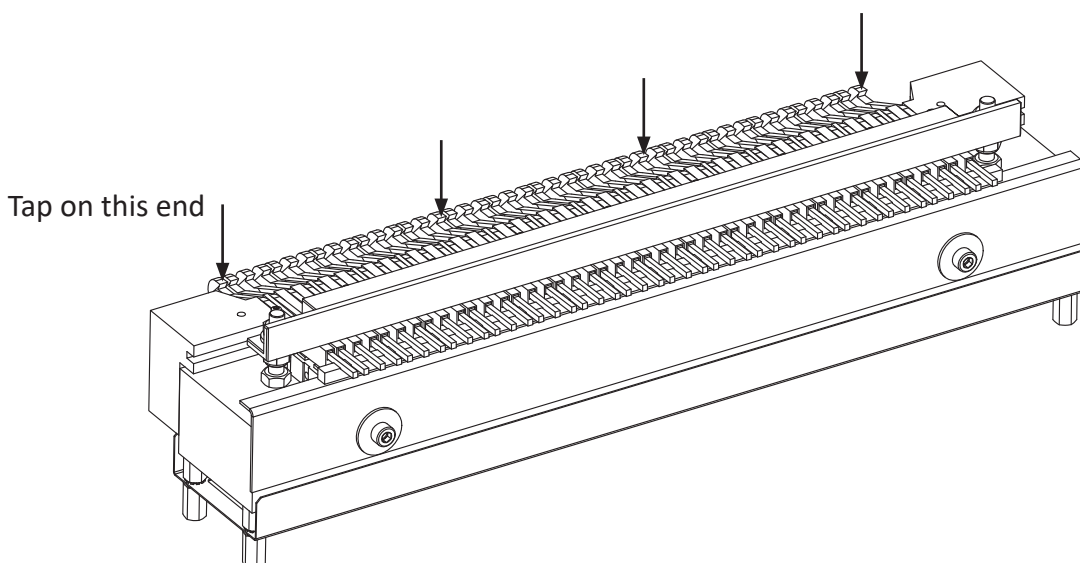
### **Sponge list**

The second adjustment is the pressure the sponge list makes against the pivot arms. The sponge list works as a return spring for the pivot arms. The correct adjustment is when the sponge list is slightly pressing against the pivot arms, but the pivot arms can still move freely. Use the 'click-test' described below to check if the pressure is sufficient.



### **The click-test**

Lay the magnet rack on a table as shown on the figure below. Then tap with your fingers on the end of the pivot arm as the arrows indicates. If you can hear a 'click' when tapping, increase the pressure on the sponge list a little.



## 6.11 Magnet rack - refitting and adjusting

Before putting the magnet rack back on the printer, make sure that the magnet rack itself is adjusted as described in the previous section.

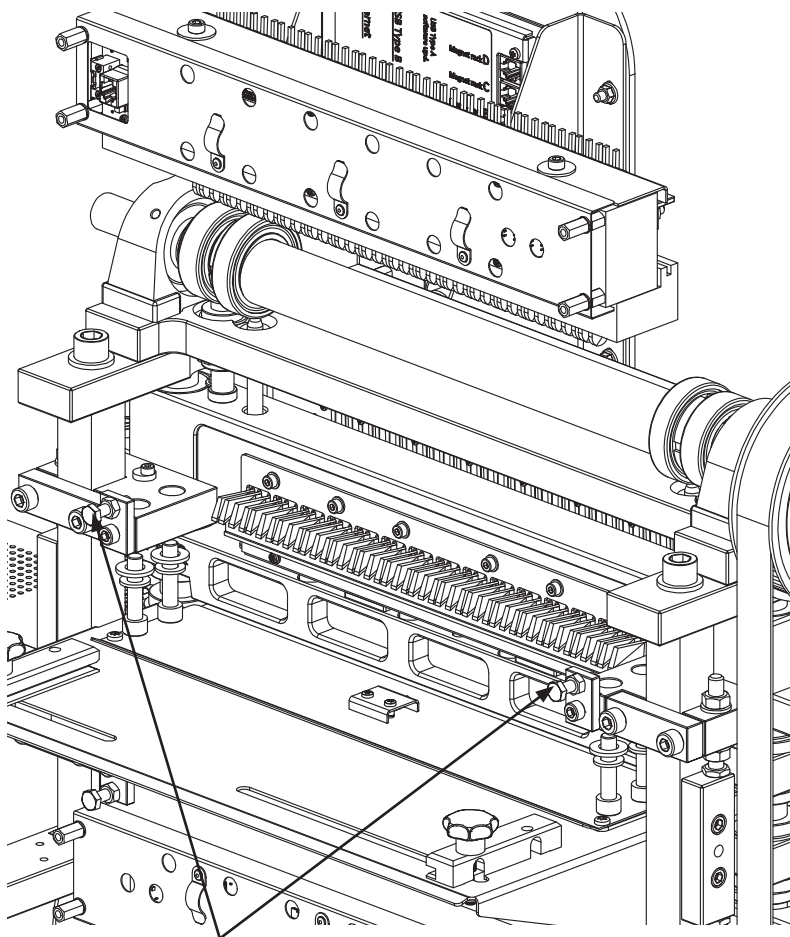
When placing the magnet rack in the printer:

Put in the four fastening screws, but do not tighten them. Slide the magnet rack horizontally away from the printer, so that the magnet rack is touching the horizontal adjustment screws. This will ensure that the magnet rack is in the exact same position as before it was taken off the printer.

See next section regarding correct adjustment of the magnet racks.



Note! All explanations refer to one magnet rack, but these adjustments must be done on all four magnet racks.

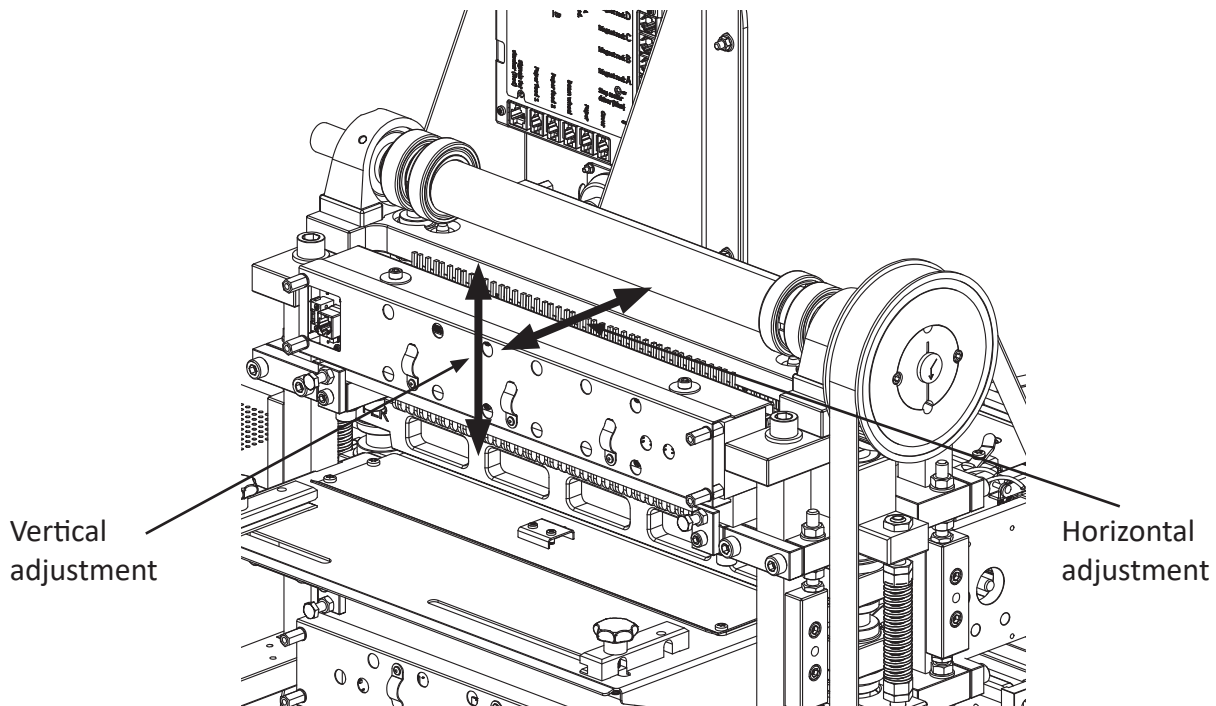


Pull back against these positioning screws on both ends

The magnet rack must be adjusted in two directions, horizontal and vertical.

The horizontal adjustment is done first. This adjustment positions the magnet rack correctly in relation to the short pivot arms. If the printer prints too many or too few dots, the horizontal adjustment could be the problem.

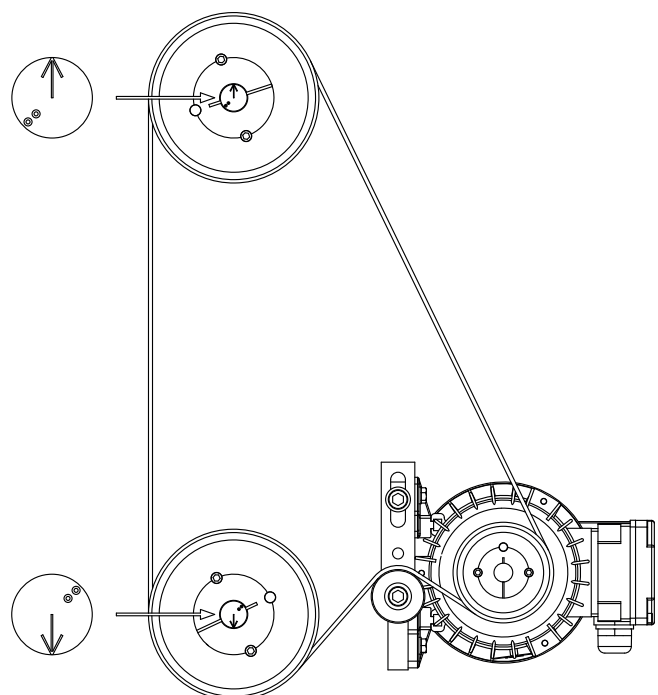
Then the vertical adjustment is done. This adjustment will affect the pressure the pivot arms put on the printing pins. This directly affects the shape of the printed dots.



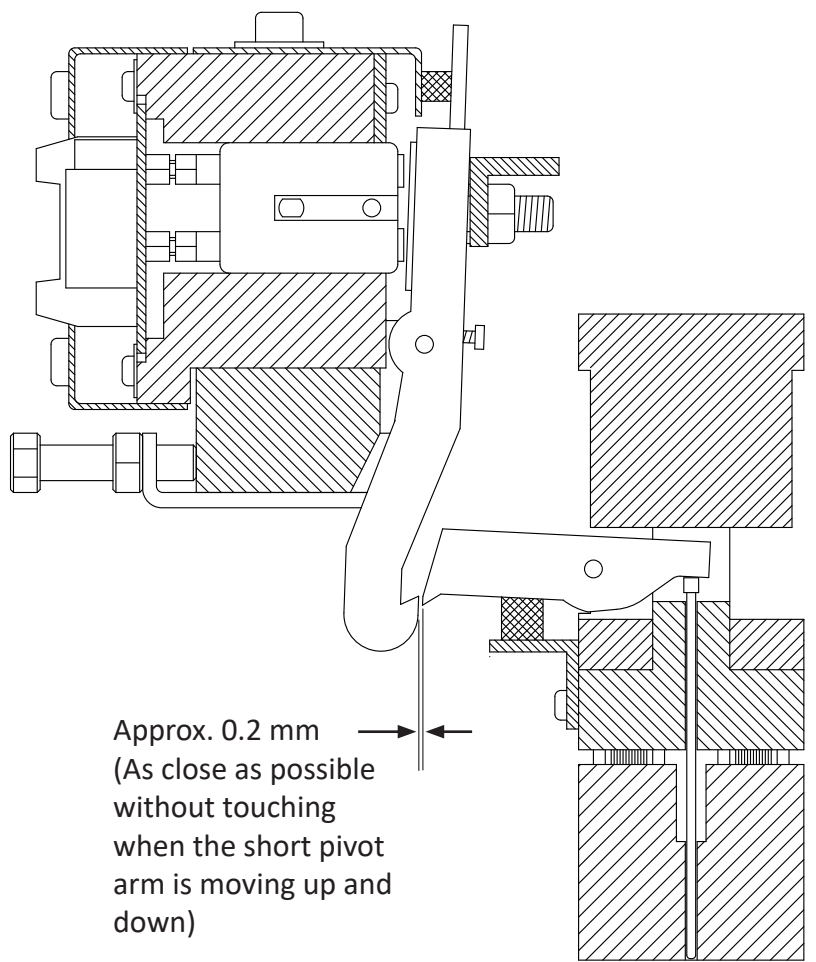
To be able to adjust the magnet rack correctly, it's necessary to put the printer in "printing position".

This is done by rotating the main belt by hand until the arrows at the ends of the shaft are pointing exactly 180 degrees away from each other.

It's possible to get the mechanism to balance in this position, but you can also lock the shafts with e.g. a self locking wrench (vice-grip pliers).



When the arrows at the end of the shafts are pointing in the opposite direction of each other, the short pivot arms will be approximately positioned like in the figure below.



The gap between the long and the short pivot arm should be approximately 0.2 mm. When adjusting this, make sure that the gap is even for all the pivot arms and the same on both ends of the magnet rack.

How to adjust:

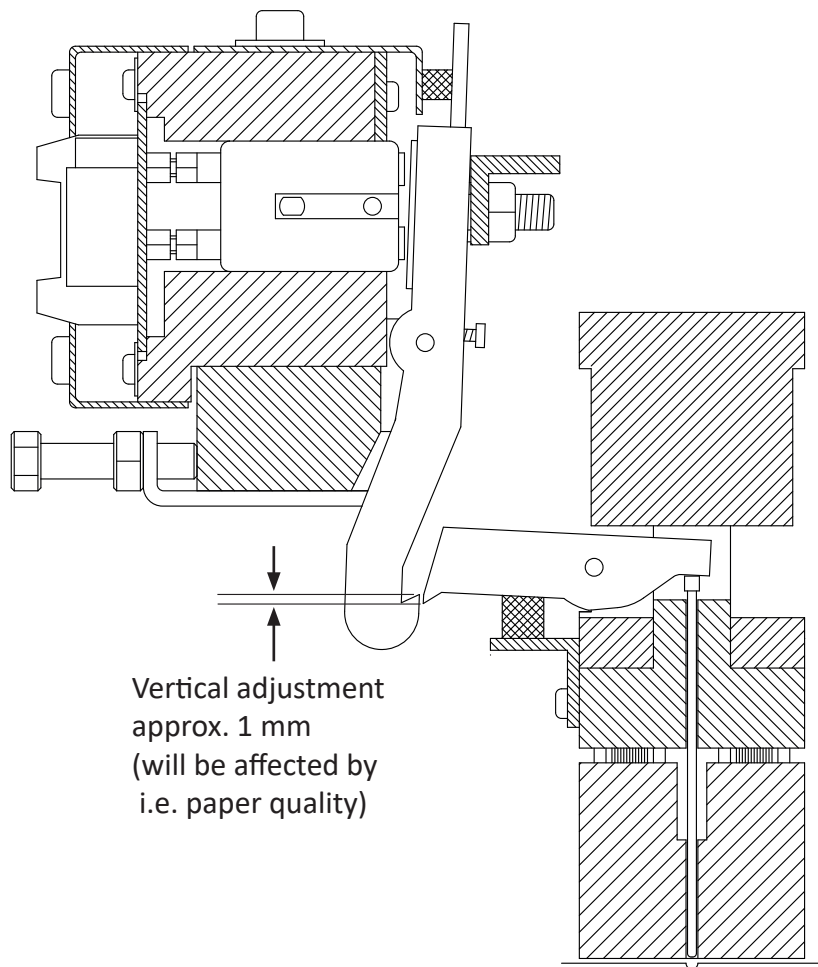
Observe that the screw for horizontal adjustment will not pull the magnet rack outwards, they will only push inward.

So the best way of doing this, is to loosen the four fastening bolts holding the magnet rack. Then unscrew the horizontal adjustment screw a little. Now slide the magnet rack outward from the printer, so it touches the horizontal adjustment screws again. Then tighten the four fastening screws just a little so the magnet rack is held firmly in place, but is still able to move. Use the horizontal adjustment screw to move the magnet rack closer to the printer. If this is done in small steps, it's possible to watch the gap getting smaller, and the trick is to stop just before the long pivot arm is touching the short pivot arm.

When the position is correct, tighten the four fastening bolts.

Next is vertical adjustment.

Note! The printer must be in the “printing position” when checking this distance.



The vertical adjustment of the magnet rack sets the pressure of the printing pins when making dots.

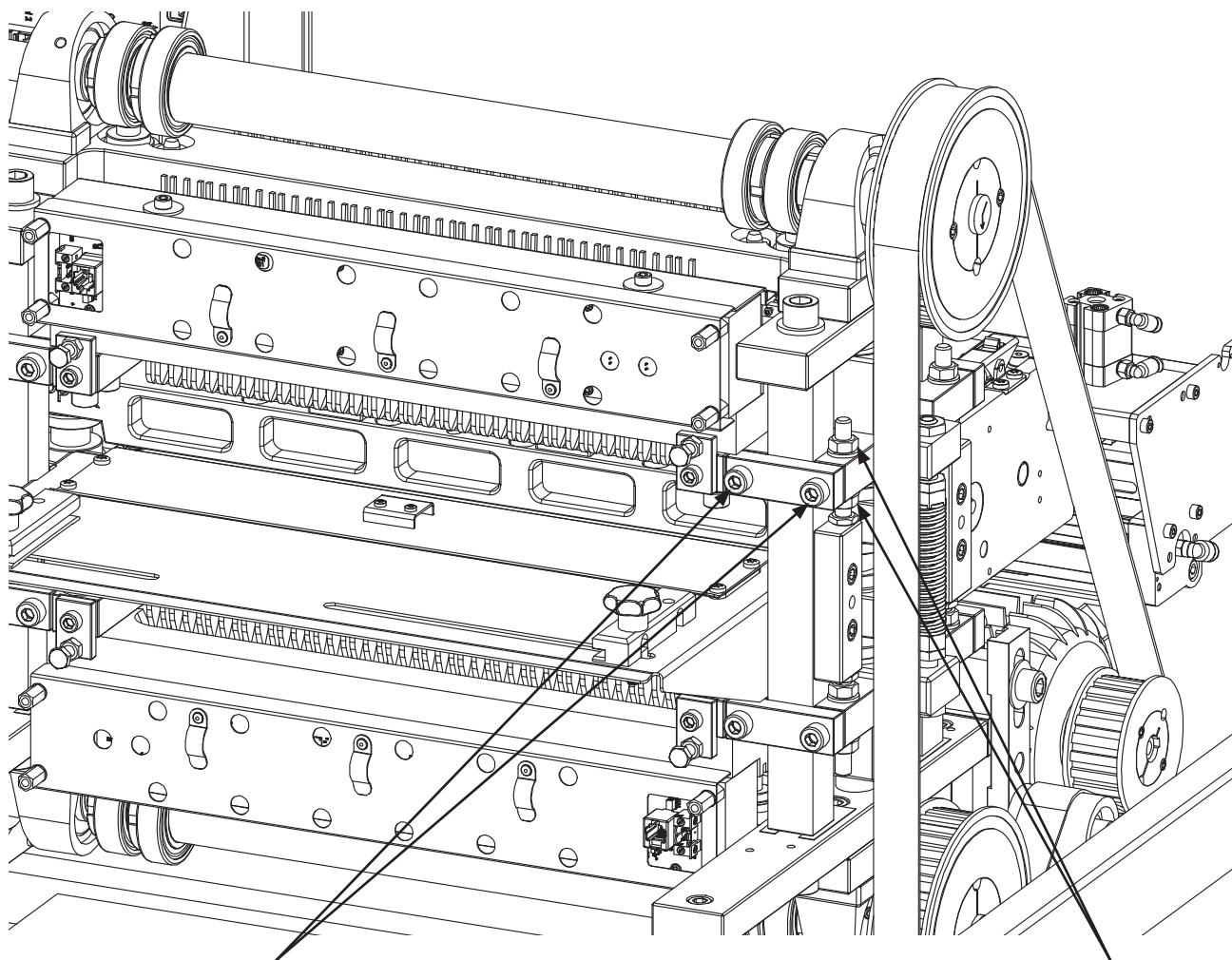
The amount of pressure needed depends on several things. The first (and most important) is the paper quality. The second, is the personal preference of the dot quality.

So the best way to find the correct level of vertical adjustment, is to first decrease the pressure so the dots will be very faded and weak.

Then readjust the pressure up in small steps until the dot quality is satisfactory. By doing this you can make sure that you are running the printer with just enough pressure to make good dots, but not so much pressure that the printer will be worn/damaged.

From our experience we have found that the vertical adjustment should be approximately 1 mm, but if the braille dots are too weak, you may adjust the magnet rack tighter in small steps (increase the 1 mm distance).

Please see figure on next page:



First, loosen these two screws

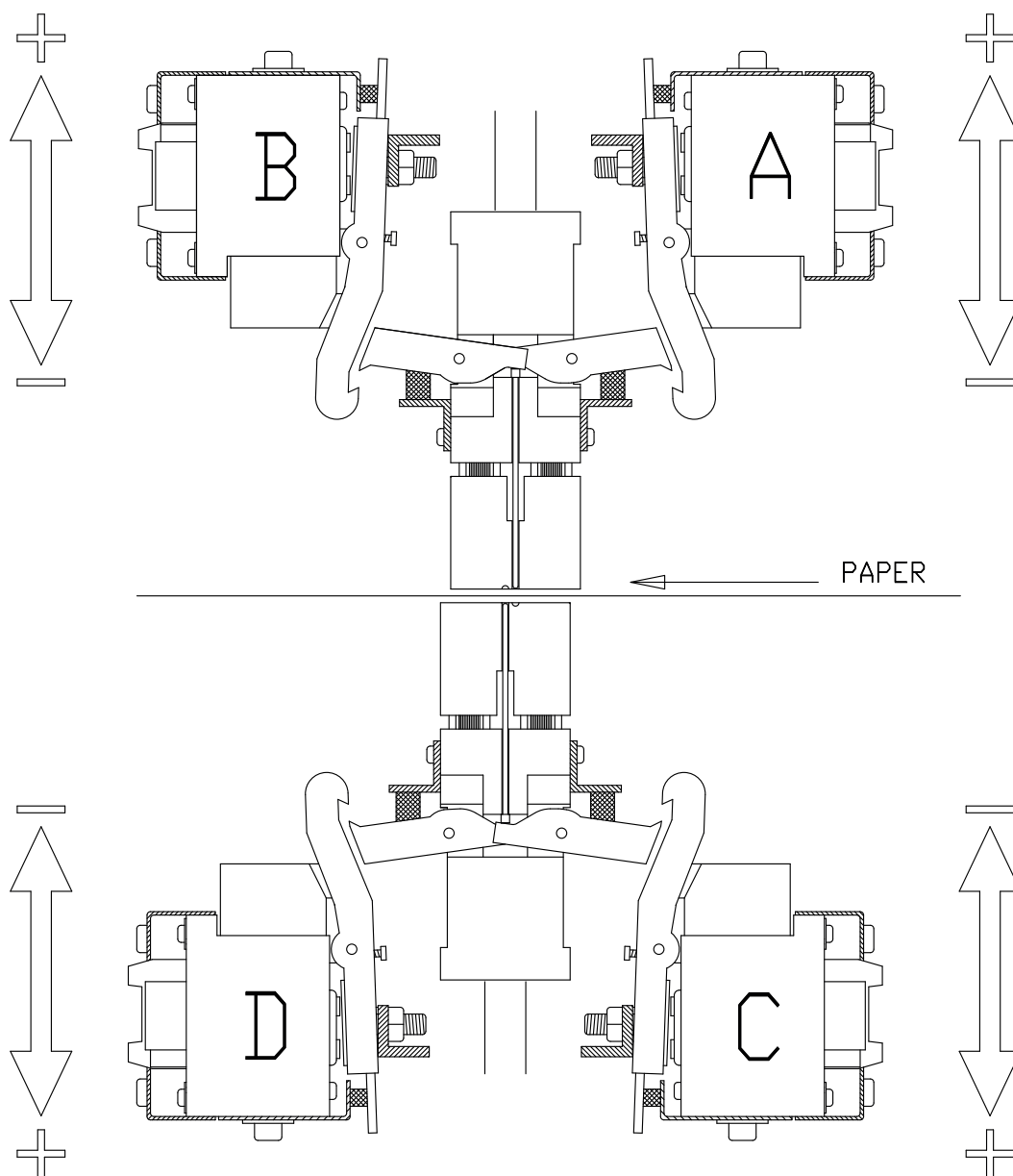
Then adjust upwards by loosening the upper nut and then tighten the lower. Do this on both ends, so the magnet rack stays levelled



Note! Adjust in small steps, only 1/4 of a revolution at a time. Then test the braille quality.



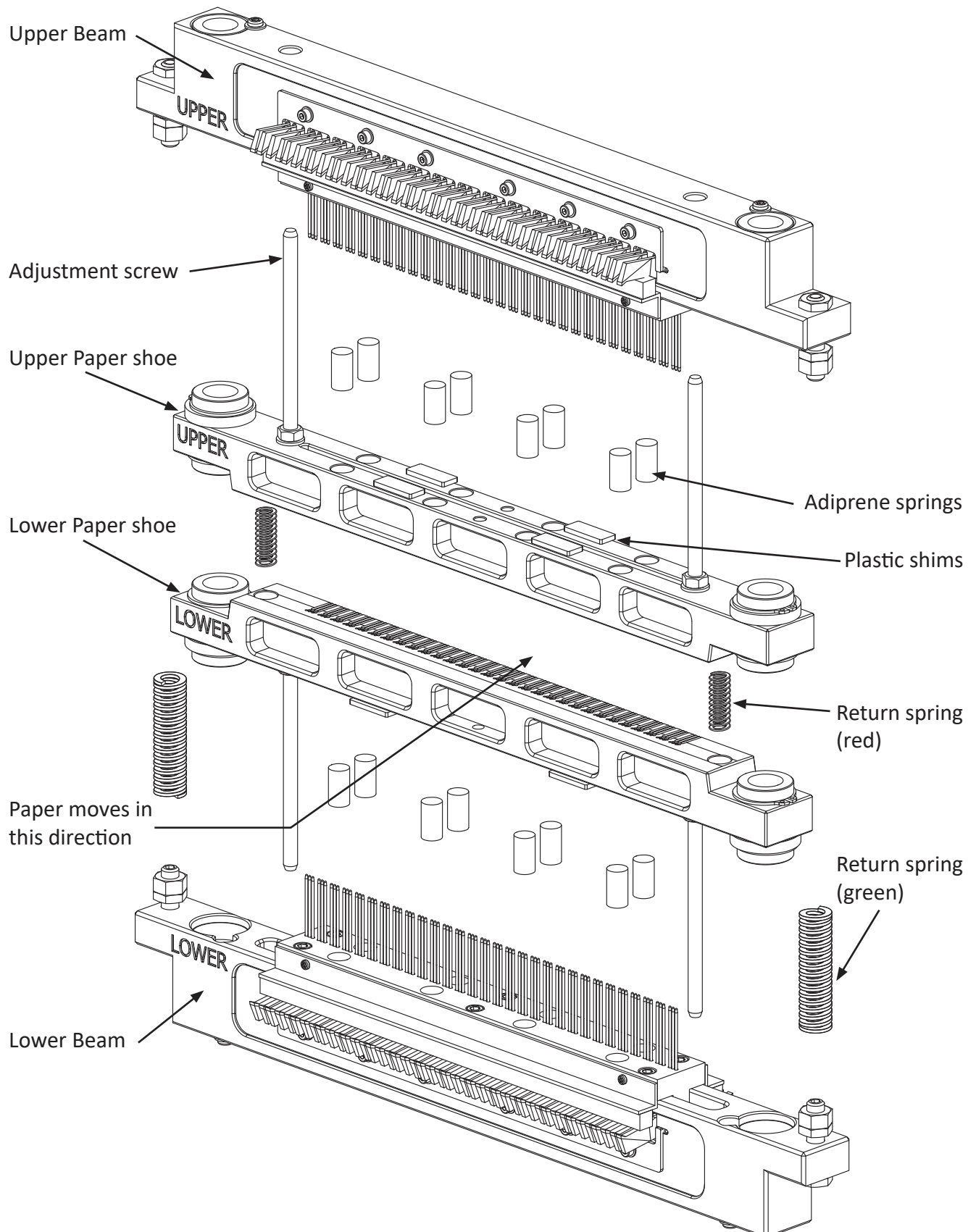
Note! When adjusting the magnet racks vertically, observe that magnet rack A and B must be moved upwards to increase the pressure, and magnet rack C and D must be moved downwards to increase the pressure.  
(Moving away from the paper increases pressure).





## 6.12 Beam and Paper shoes - overview

Please see the figures below.



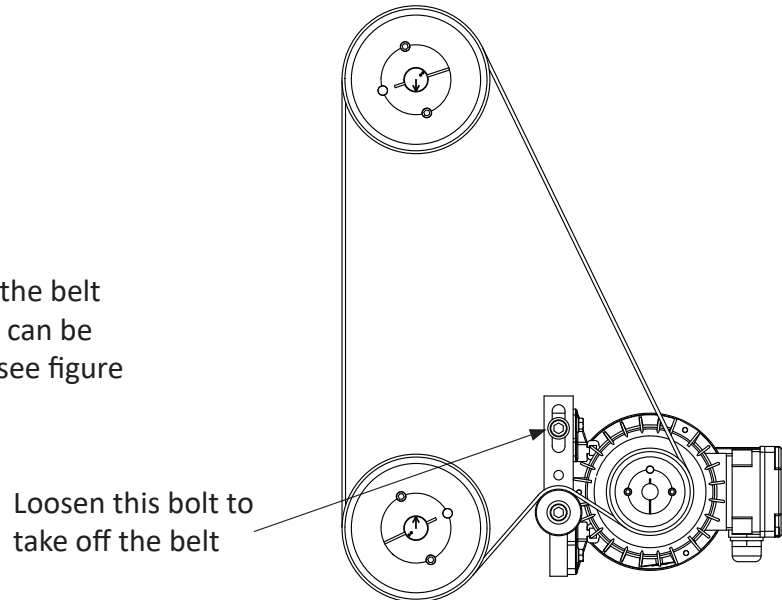
### 6.13 Beam and Paper shoes - removal and refitting

To remove the beam and paper shoes, some other parts must be removed first. It must be done in this order:

1. Remove the belt
2. Remove the input paper guide
3. Remove the paper feed tractor
4. Remove the top frame
5. Remove magnet rack A and B

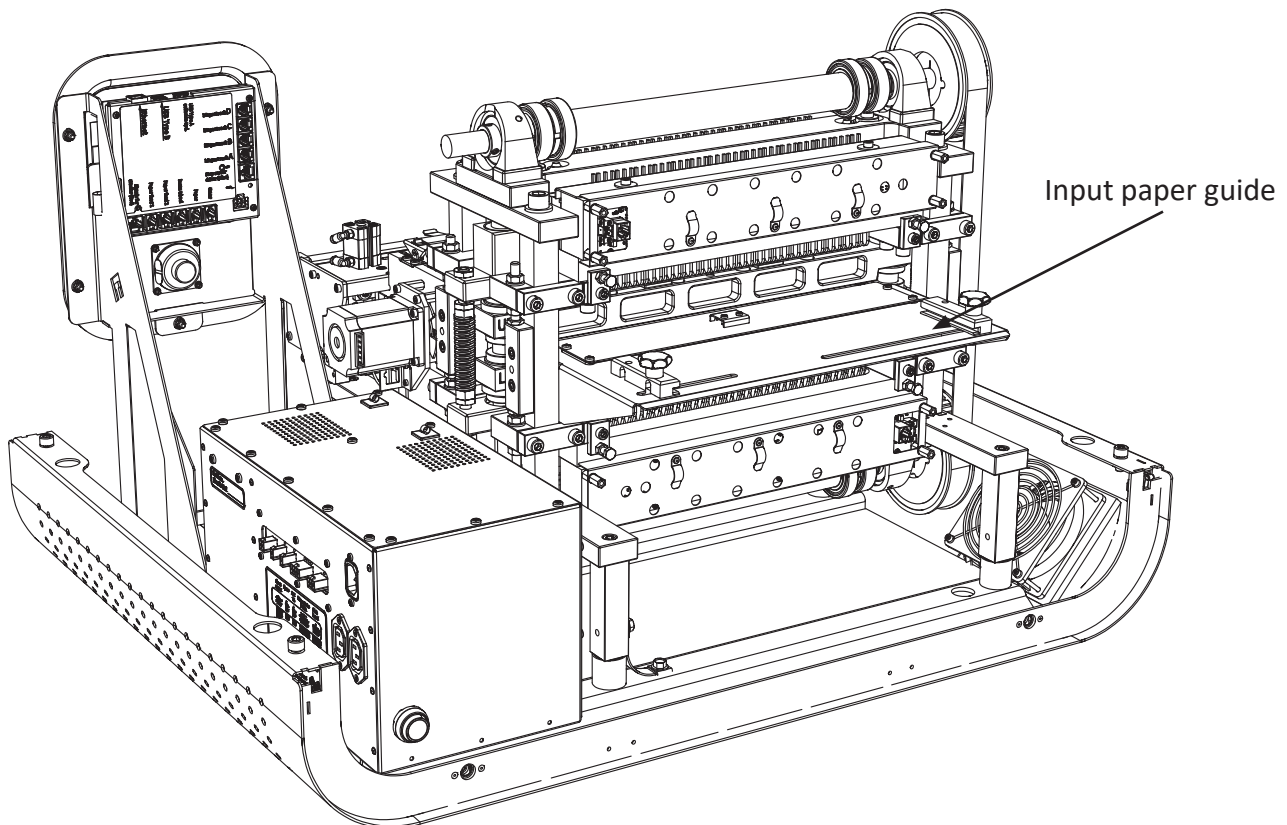
#### 1. Remove the belt

This is done by loosening the bolt for the belt tensioner. When this is done, the belt can be lifted off the upper cogwheel. Please see figure to the right.



#### 2. Remove input paper guide

See [6.23 'Input paper guide - removing' on page 121](#) for information on how to remove the input paper guide.



## Beam and paper shoes - removal and refitting (continued)

### 3. Remove the paper feed and cutter

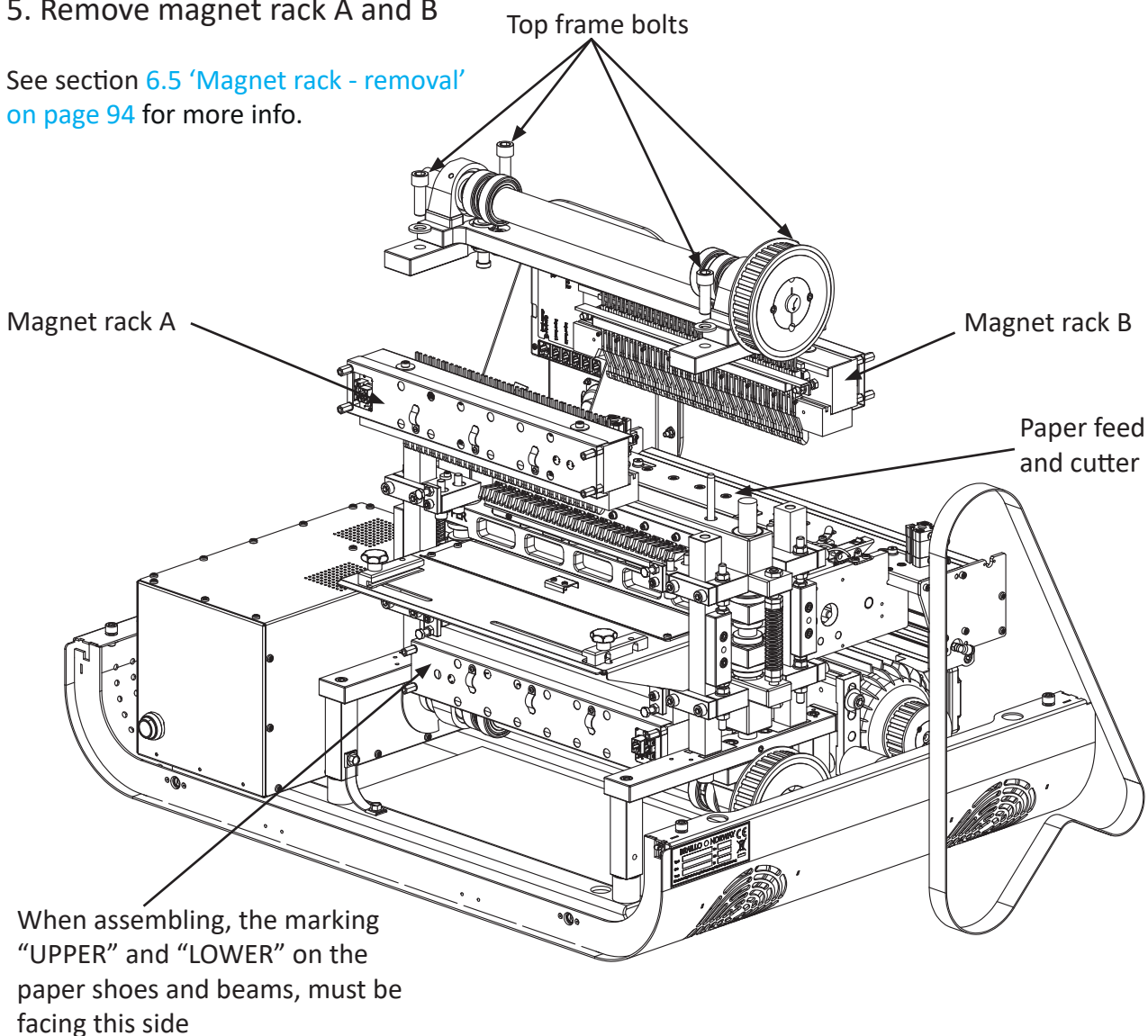
Please see section 6.20 'Paper feed and cutter assembly - removing' on page 118 for a description on how to remove the paper feed and cutter.

### 4. Remove the top frame

Unscrew the bolts as indicated on the figure below, and then lift the frame carefully upwards and place it aside.

### 5. Remove magnet rack A and B

See section 6.5 'Magnet rack - removal' on page 94 for more info.



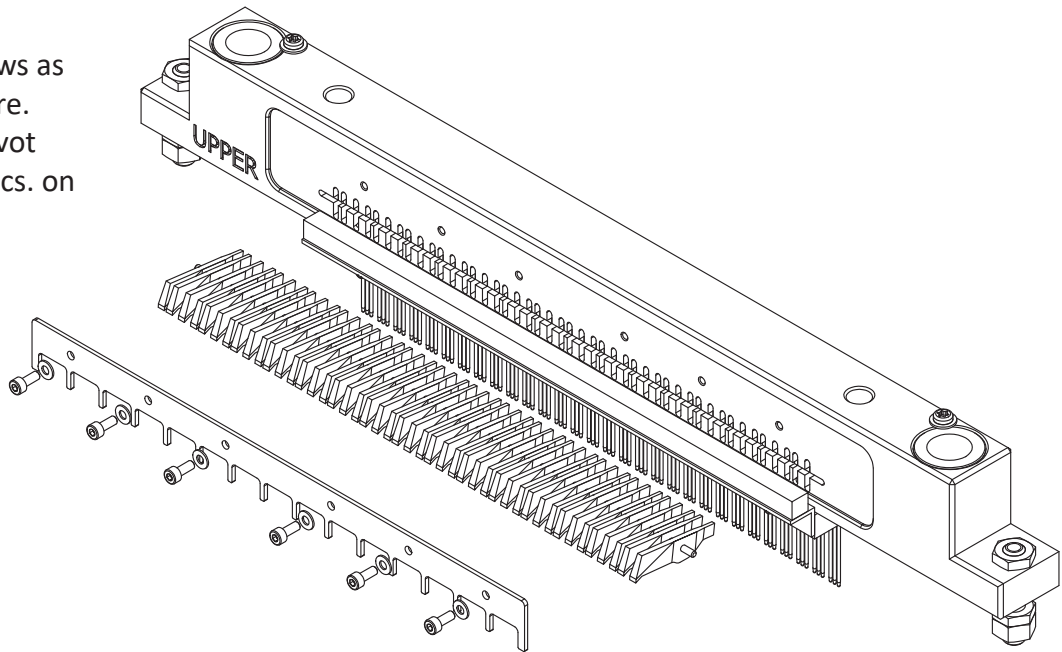
Now the paper shoes and beams can be lifted carefully upwards.

Assembly is done in the reverse order. Please note that the marking "UPPER" and "LOWER" on the paper shoes and beams should be turned to the side where the paper enters the printer.

## 6.14 Beam - replacement of short pivot arm

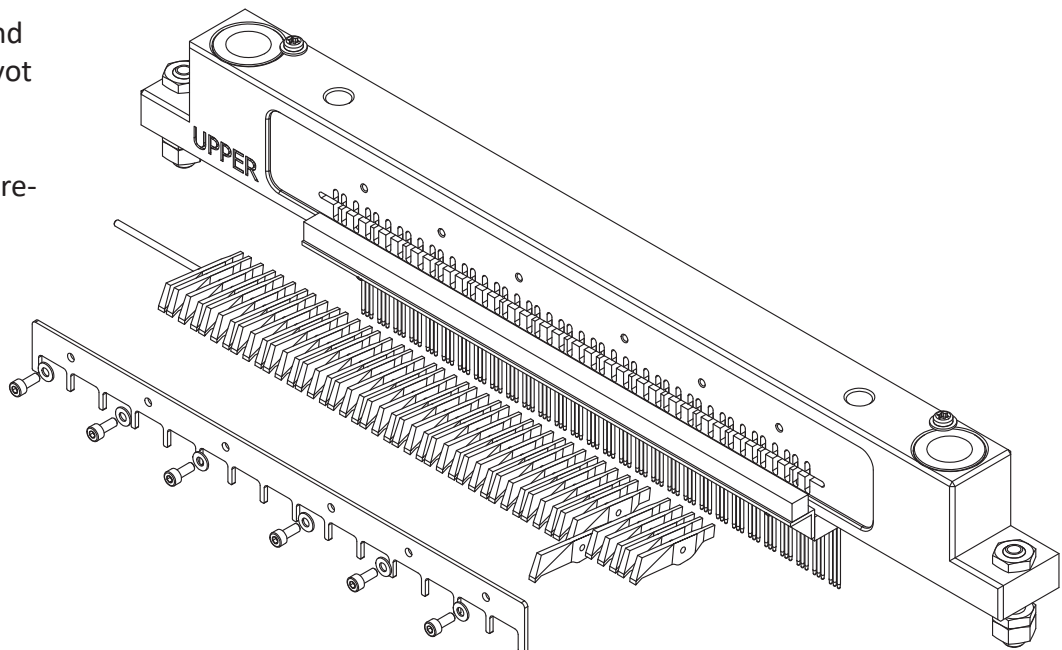
See the figures below.

Remove the six screws as indicated in the figure. Pull out the short pivot arms, there are 45 pcs. on each side.



Pull out the shaft, and replace the short pivot arm(s).

Assembly is done in reverse order.



Note! When putting the short pivot arms back into the beam, be sure that the printing pins are hanging vertically like in the figure. This is to make room for the short pivot arm.

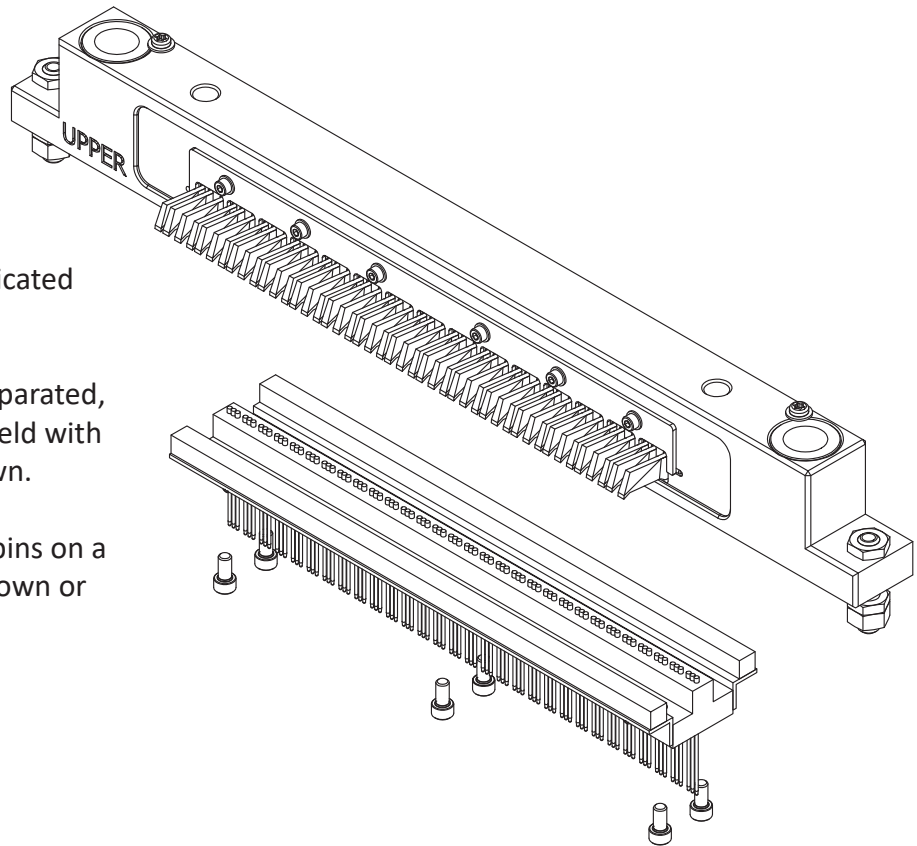
## 6.15 Beam - replacement of printing pin

See the figures below.

Remove the six screws as indicated on the figure.

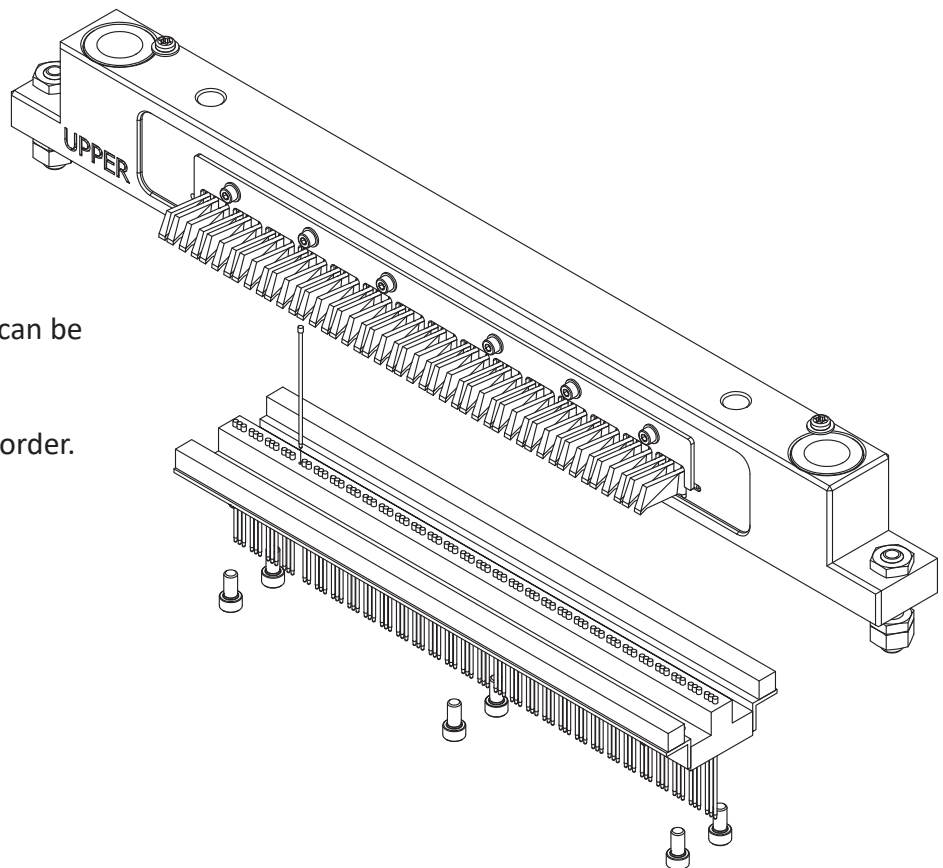
Note! Before the parts are separated, make sure that the beam is held with the printing pins hanging down.

Place the pin guide with the pins on a table. Do not turn it upside down or all the pins will fall out!!



Now the defect printing pin can be replaced.

Assembly is done in reverse order.



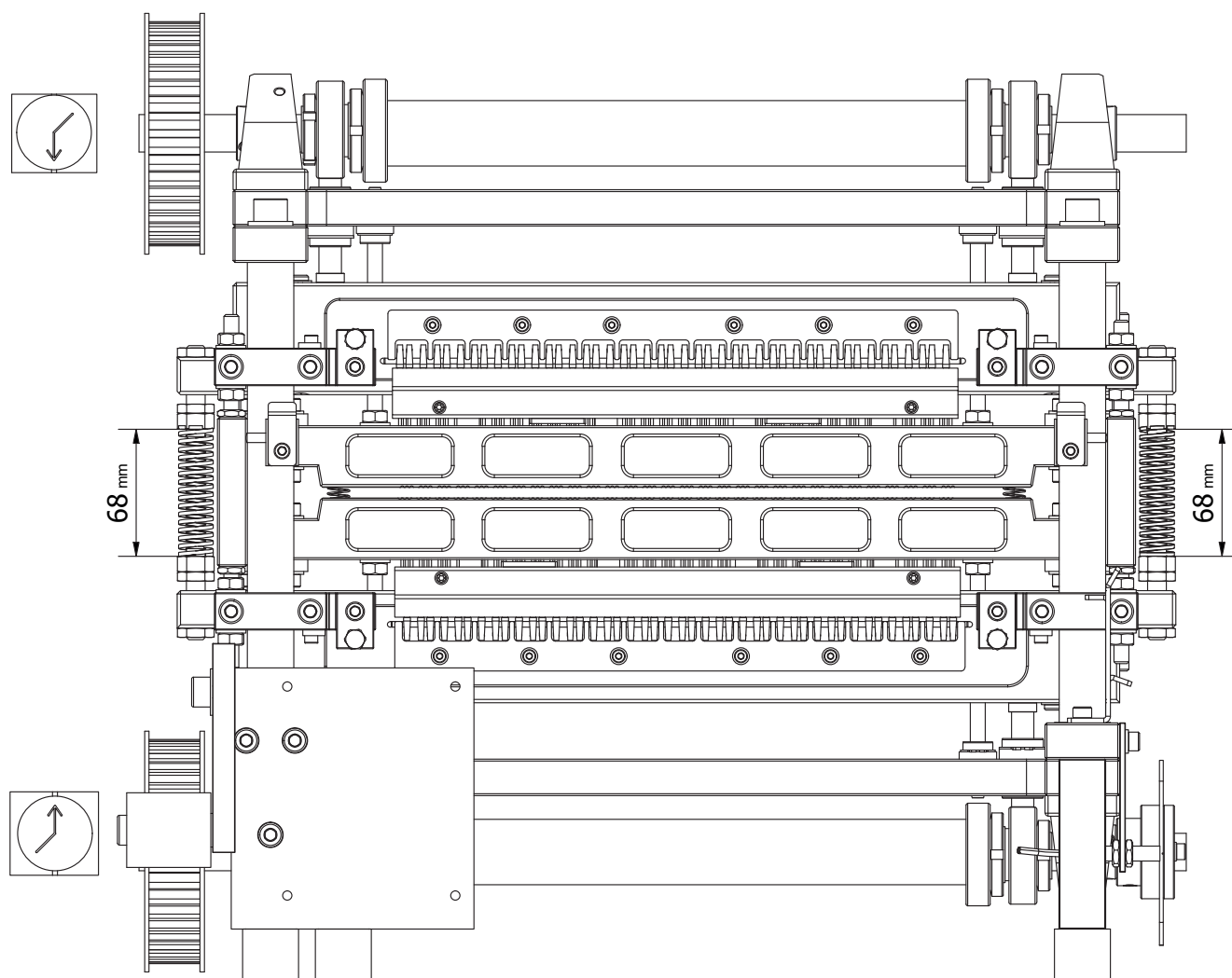
## 6.16 Return spring adjustment

Before performing this adjustment, make sure that the shafts are turned to the correct position. See the marks at the end of the shafts, the arrows must point directly towards each other, like in the figure below.

Then the springs can be adjusted to the correct length, i.e. 68 mm.



Note! It's critically that the length of these two return springs are 68 mm!



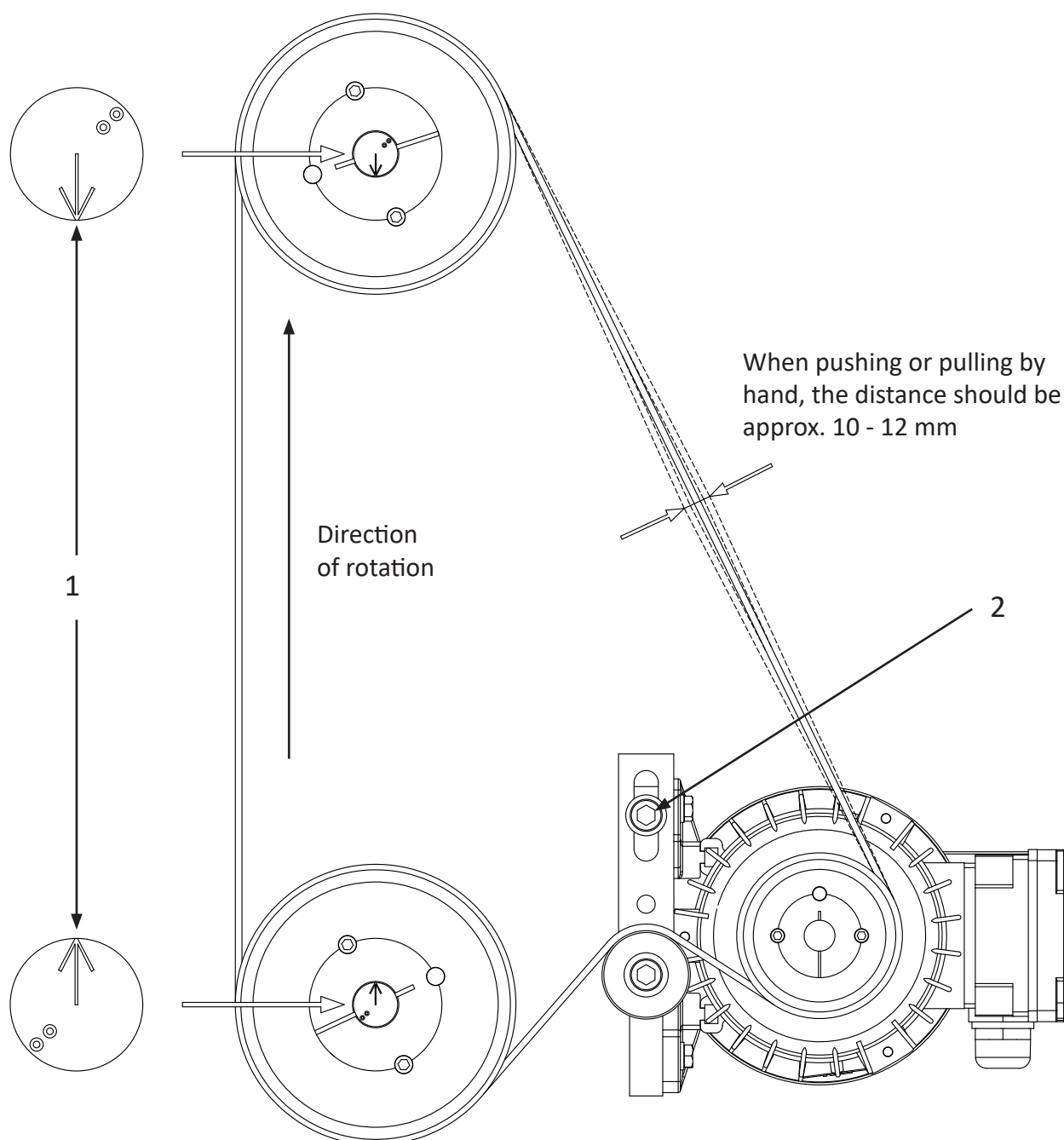


## 6.17 Eccentrics adjustment, belt tension

After removing the belt, it's necessary to align the eccentrics.

Put the belt back on, tighten it with the belt tightening wheel (2), and check that the arrows at the end of the shafts (1) are pointing towards each other. See figure below.

If the marks are not aligned like in the figure, it might be necessary to move the belt a notch or two on one of the wheels. This is done by loosening the belt tightening wheel (2) again, and then lift the belt up from the big wheel and move it a notch on the wheel. Then tighten the belt.



## 6.18 Paper shoes - adjustment

Place a sheet of paper between the paper shoes (P).

Turn the belt so the two points (6) at the end of the shafts (2) are pointing towards each other as shown in the figure below.

Lock the shafts in this position with a vice-grip, e.g. at the end of the shaft (2).

Loosen the locking nuts (1), adjust the push rods (3) by turning them. Adjust the push rods against the inner eccentric bearing (4) until the paper shoes (P) have a light pressure on the paper.

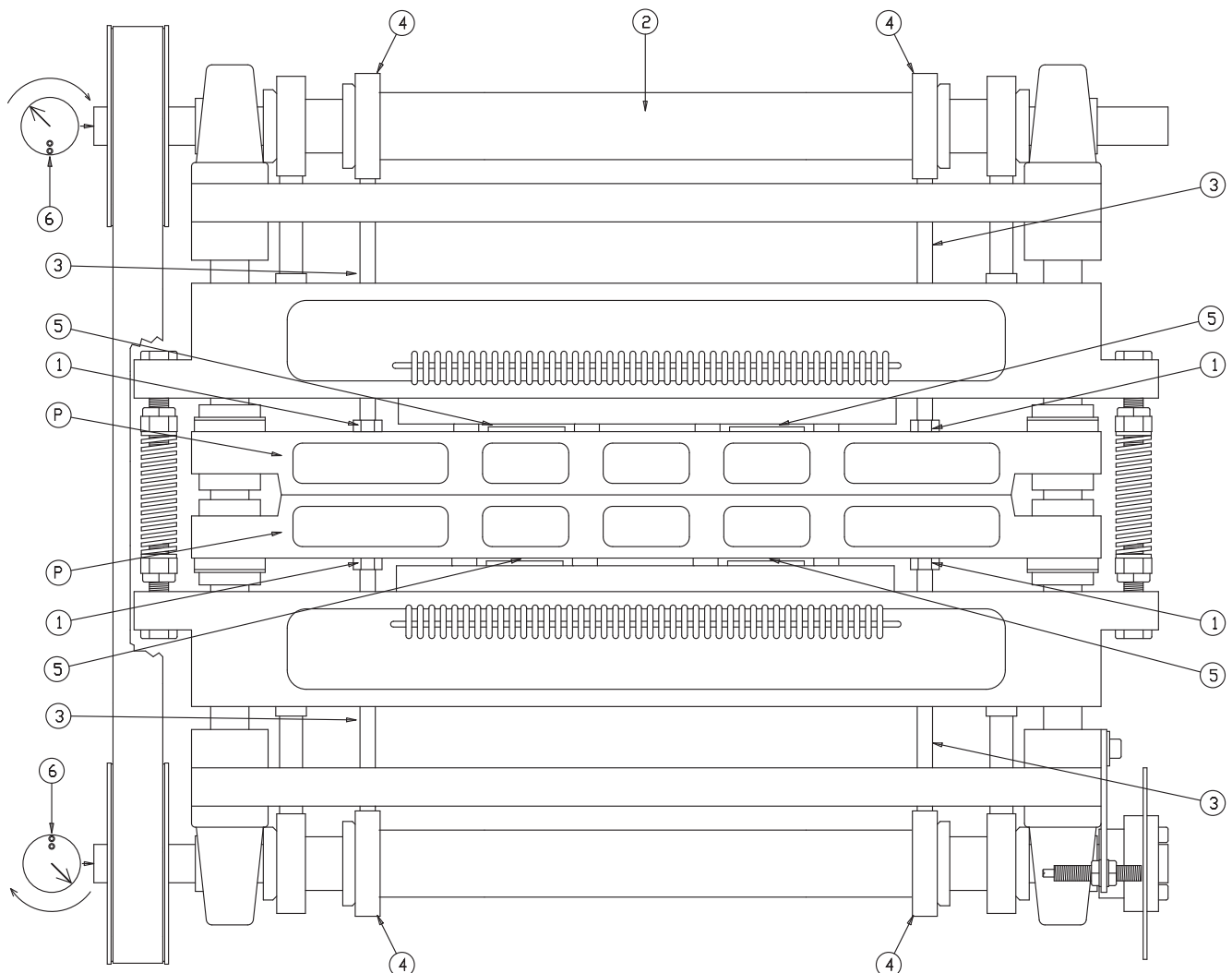
Check that the gap (5) between the press plates and the beam above, is equal on both upper and lower units.

Secure the push rods (3) with the locking nuts (1).

Make sure that the shafts can rotate freely by turning the belt by hand.



Note! The function of the bearings (4), is to reduce the noise the printer makes while running. It's a common misunderstanding that you can increase the pressure on the paper shoes by adjusting these push rods. This does not have any influence on the dot quality!





## 6.19 Main sensor wheel - adjustment

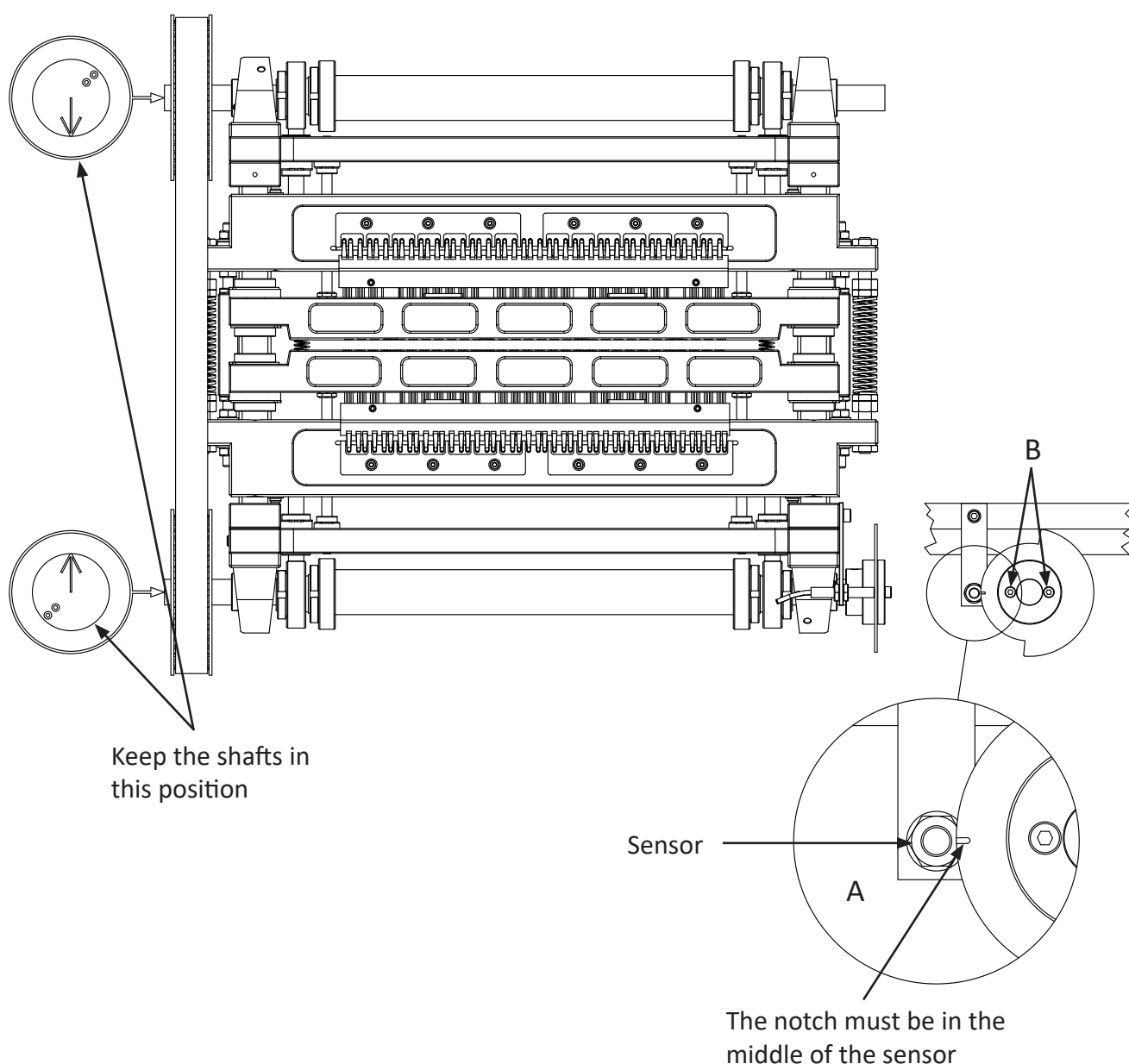
The main sensor wheel is placed on the lower shaft, on the opposite end from the belt.

The shafts must be in the position indicated to the left in the figure below.

The timing wheel should now be placed exactly like position (A) in the figure below, i.e. the mark in the middle of the opening in the wheel is placed just opposite the sensor.

If the timing wheel is not in correct position, it must be adjusted.

Keep the shafts in this position while loosen the screws (B) holding the timing wheel. Turn the timing wheel until the inductive sensor is placed just opposite the mark in the middle of the opening in wheel. Then fasten the screws again.

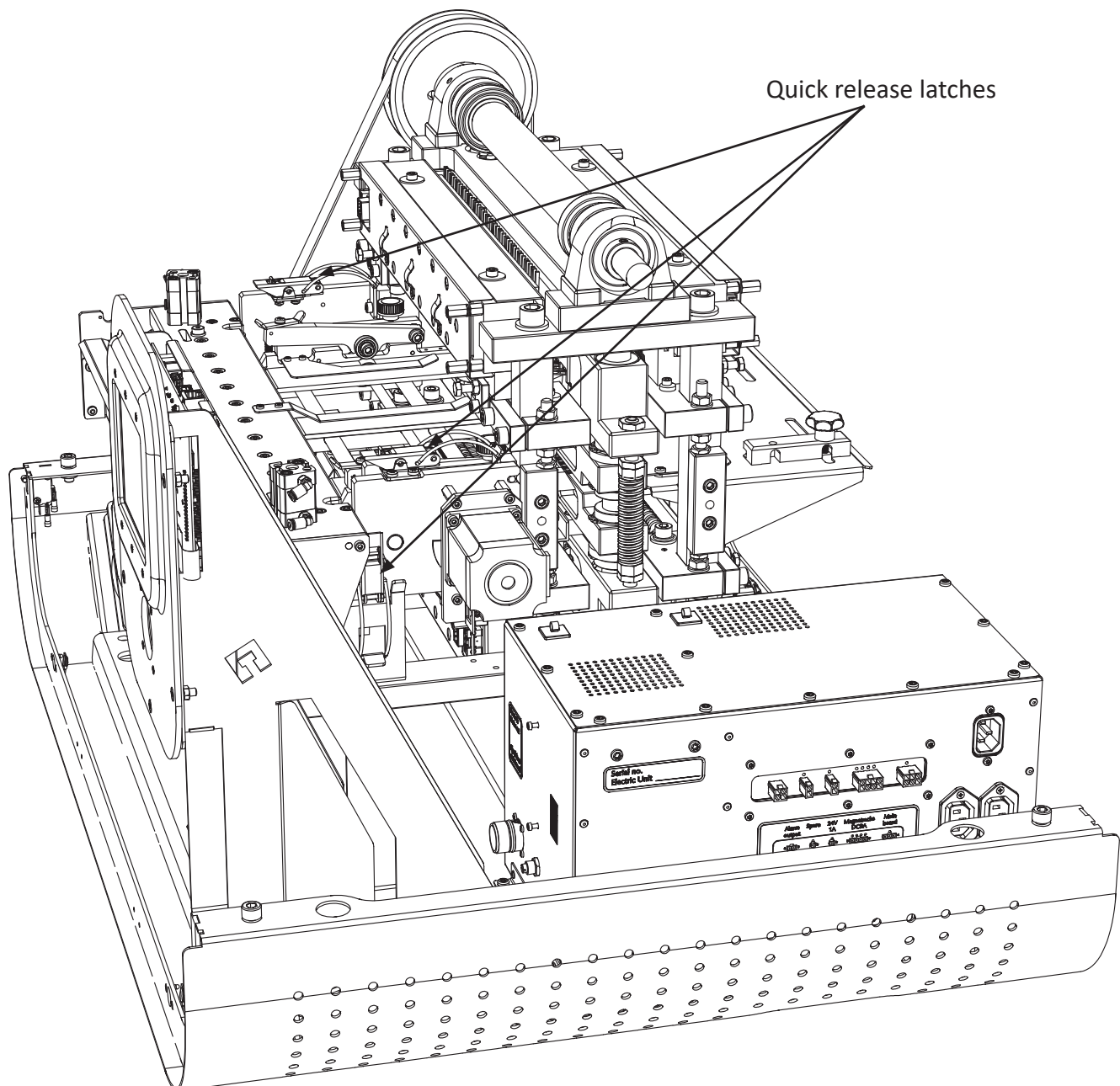


## 6.20 Paper feed and cutter assembly - removing

To remove the paper feed and cutter assembly, disconnect the stepping motor cable connector near the stepping motor. The sensors must be disconnected from the board.

Disconnect the compressed air tubes connected to the cutter.

The paper feed and cutter assembly can then be removed by opening the three quick release latches. Then lift the assembly carefully up and out.

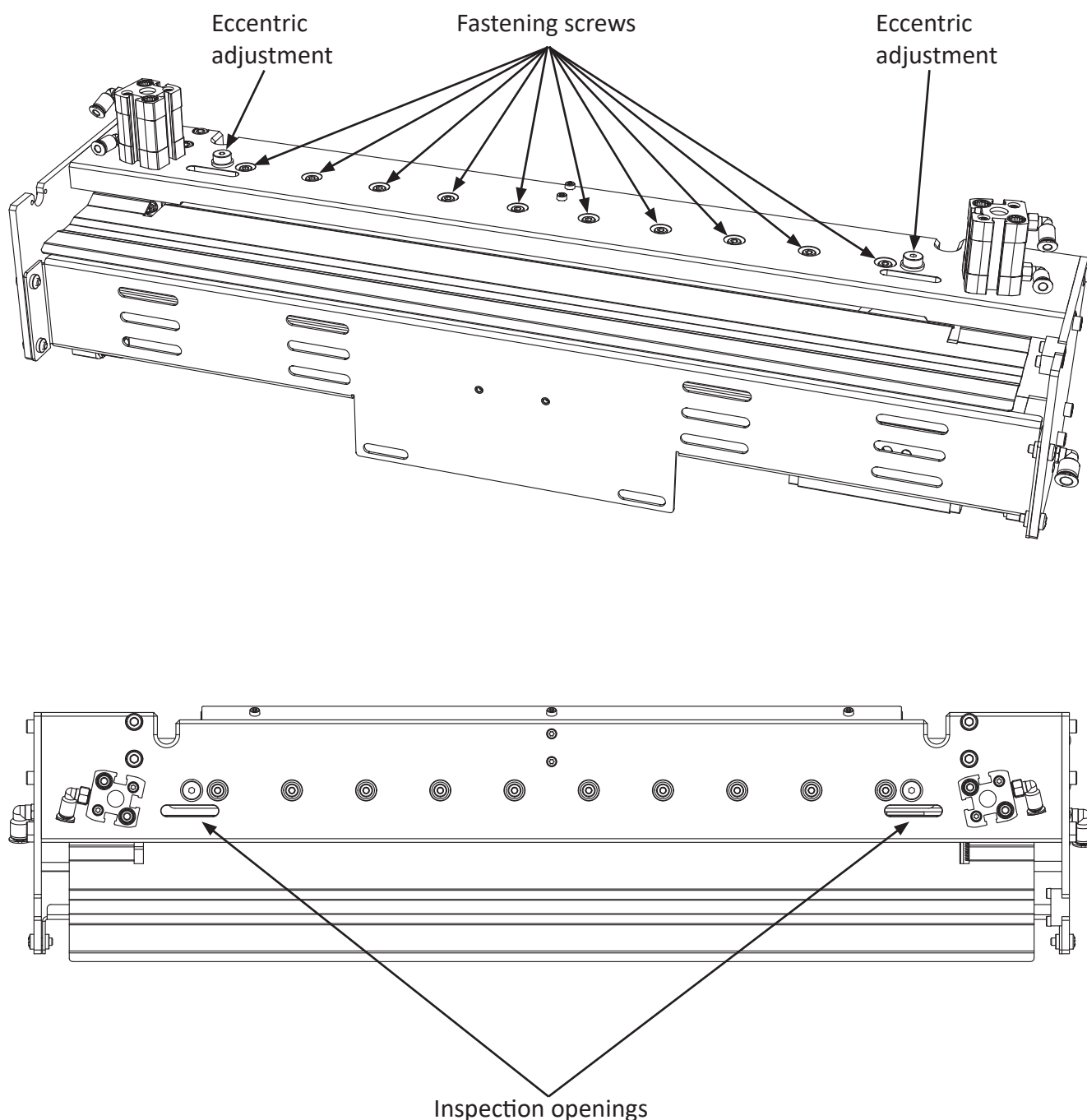


## 6.21 Paper cutter - alignment

If the fixed blade on the cutter has been removed, it needs to be adjusted when putting it back. If the fixed blade is not aligned with the roll blade, the cutted edges on the paper might get a little torn instead of a clean cut. Often this could be a problem when the roll blade is going in one direction, but OK when going the opposite way.

To adjust the alignment, loose all the ten fastening screws a little, then adjust the fixed blade back or forth with the eccentric adjustment bolts.

It's possible to see the cutting edge on the fixed blade through the inspection opening.



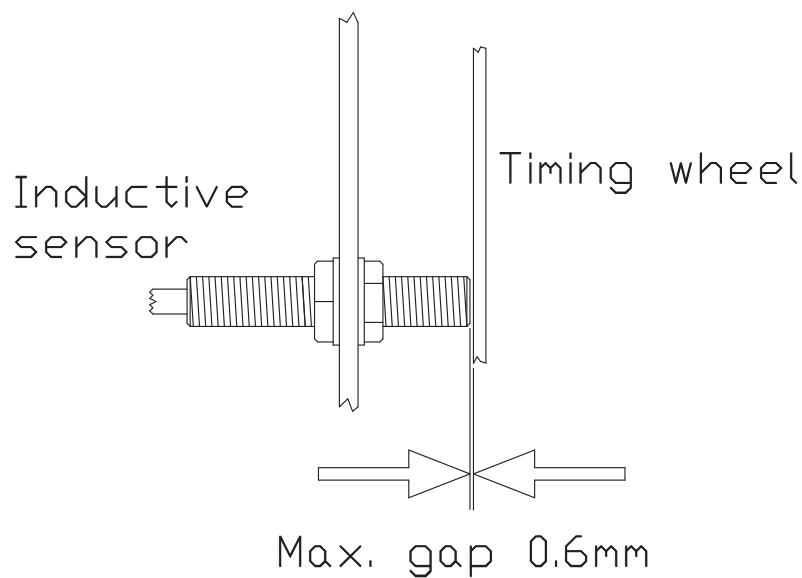
## 6.22 Inductive sensors - adjustment

This printer uses inductive sensors in three places. One for the main timing wheel on the lower shaft, and two are controlling the movement on the paper feed mechanism.

It's possible to check if the inductive sensors are functioning by looking at the rear end where the cable enters the sensor. Inside the sensor is a little LED lamp that will be lit if a magnetic object is in front of the sensor. So by having the power turned on, and at the same time turning the shafts, the light should go on and off.

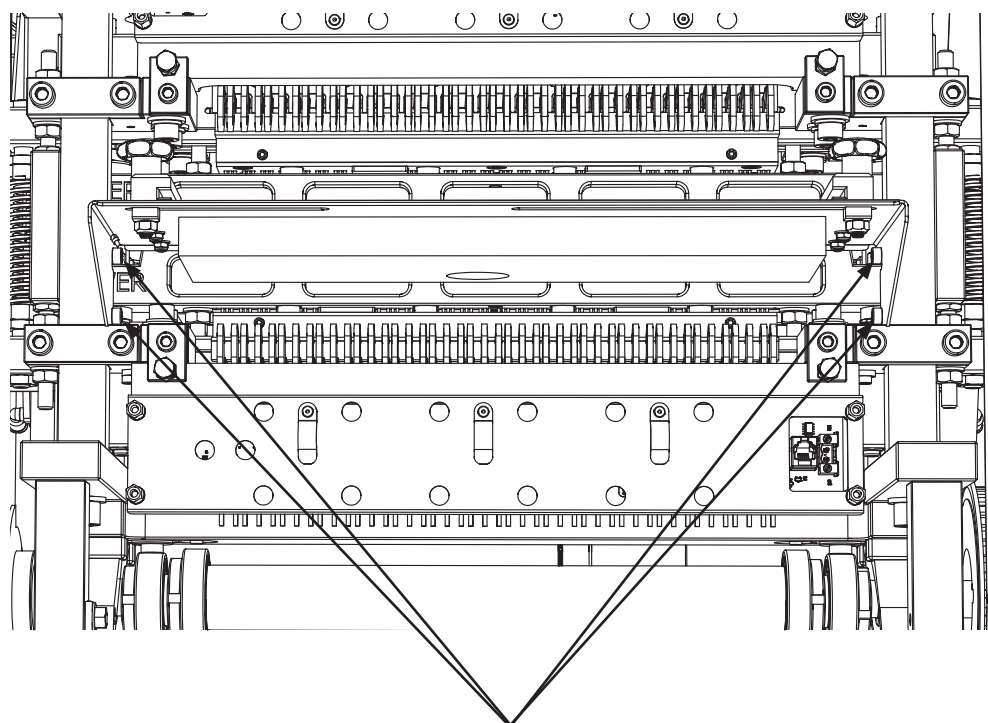
When replacing/adjusting the sensors, the gap between the timing wheel and the sensors can be maximum 0.6 mm. Check this for the whole revolution of the timing wheel.

See figure below.



## 6.23 Input paper guide - removing

To remove the Input paper guide, you must loosen the four bolts like shown in the figure below. There is no need to remove the bolts completely, just loosen them, and then lift the assembly up and pull out.



Loosen these four bolts

## 6.24 Paper sensor - replacing

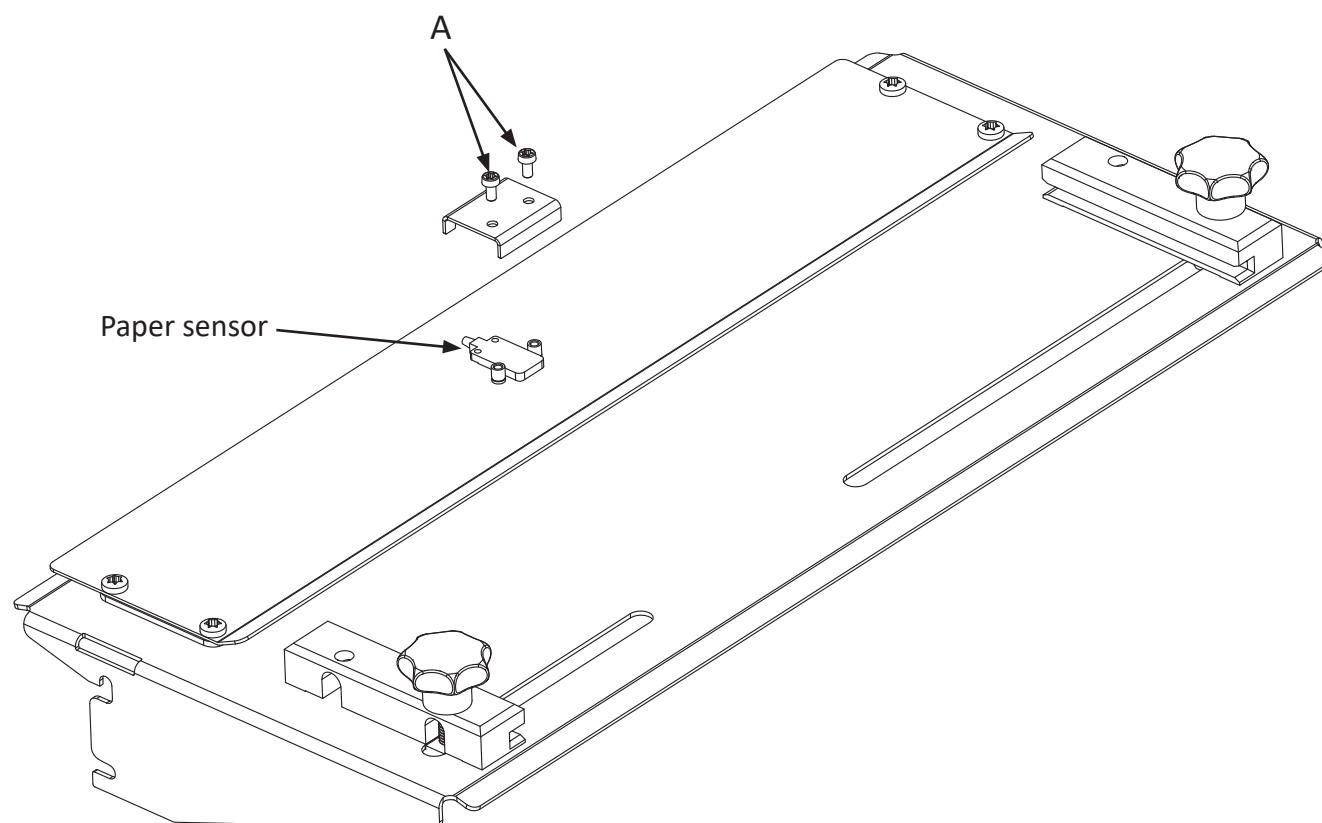
This printer has a sensor to detect if paper is present in the printer.

This sensor is situated on the paper guide where the paper enters the printer.

The sensor is an infrared reflective type, and it works by an infrared lamp which is sending light downwards, and if there is paper present, the light will be reflected back and detected by a photo transistor.

If the sensor needs to be replaced, it can be done like this:

Take the paper guide out of the printer. Unscrew the screws (A).

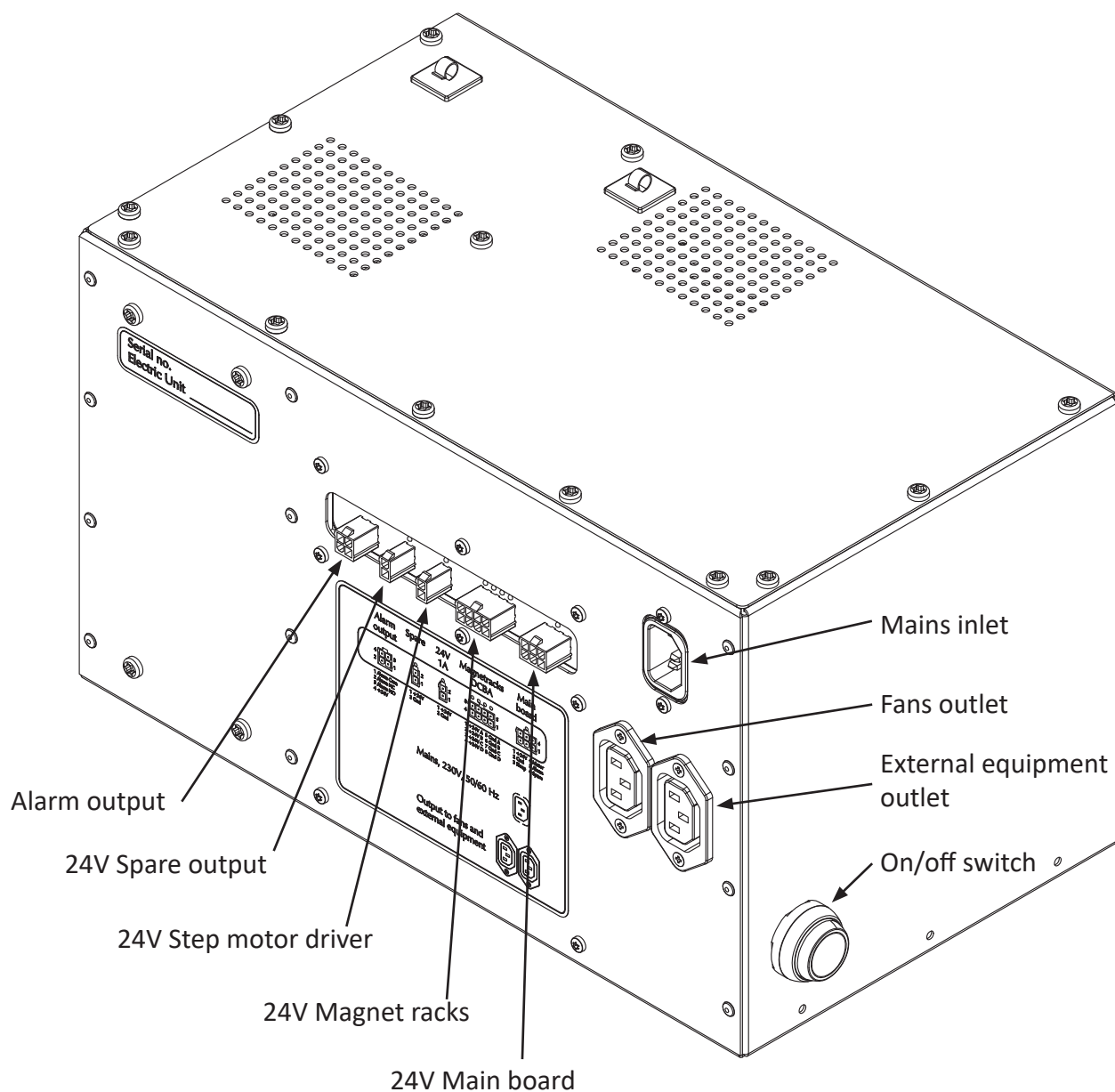


## 6.25 El-Unit - overview

The El-Unit contains connections, fuses and power supply.



Note! Disconnect the mains when working on this unit!

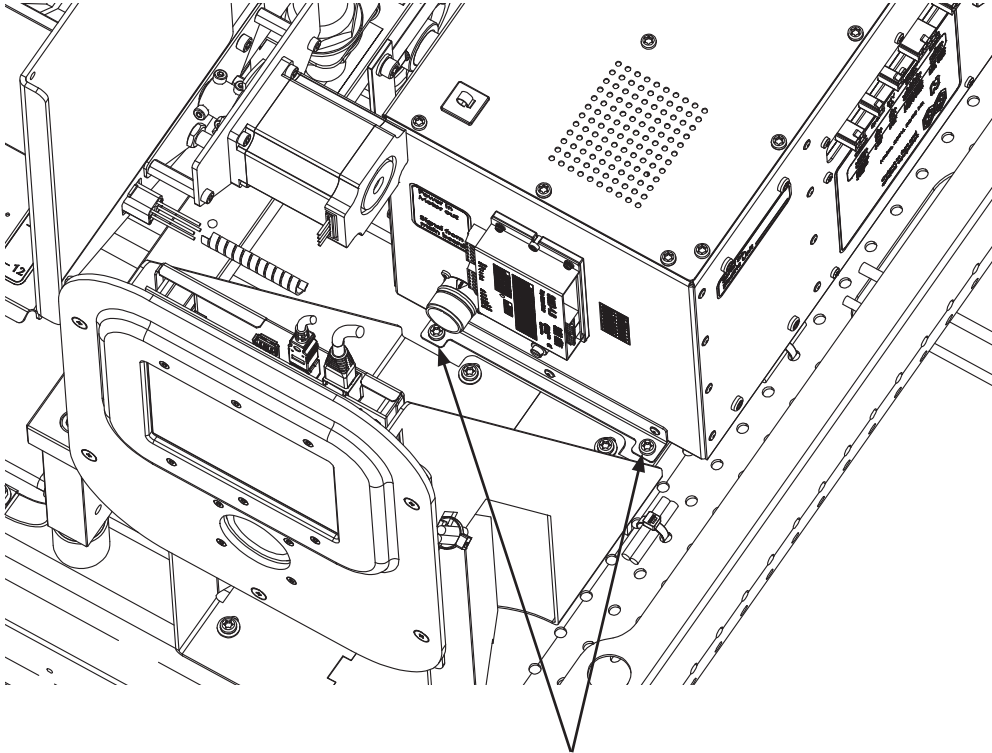




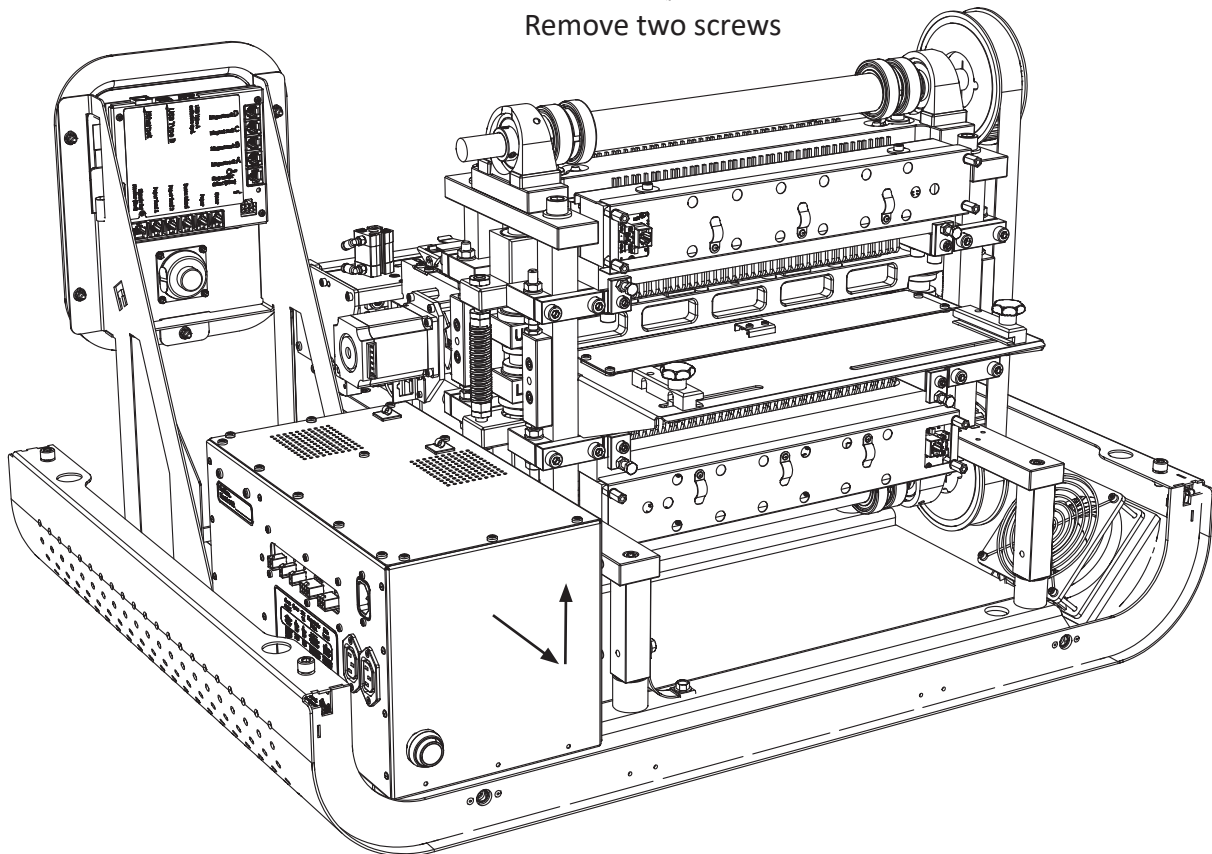
## 6.26 Disassembly the EI-Unit

Disconnect all cables plugged into the EI-Unit.

The EI-Unit can be disassembled by removing the two screws at the end and then sliding the EI-Unit approx. 10 mm backwards and then lifting the EI-Unit upwards. See figures below.



Remove two screws

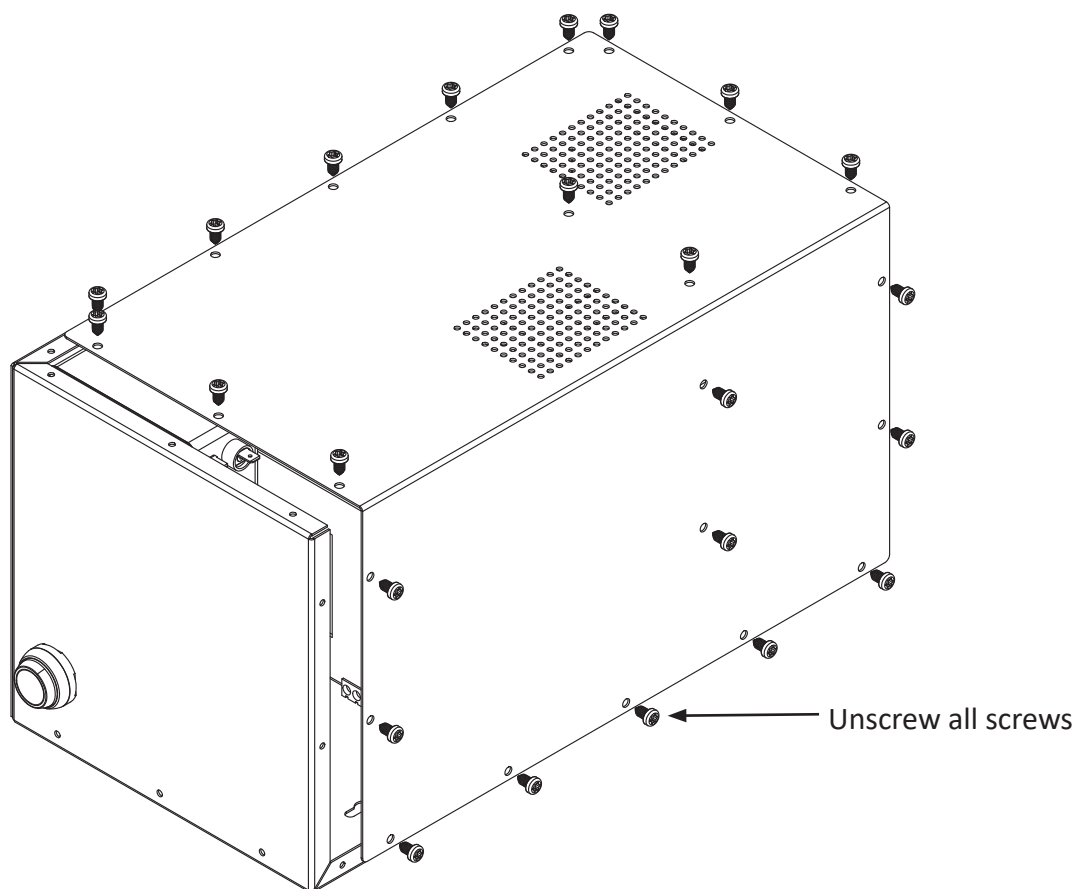


Slide the EI-Unit a little backwards, then lift up

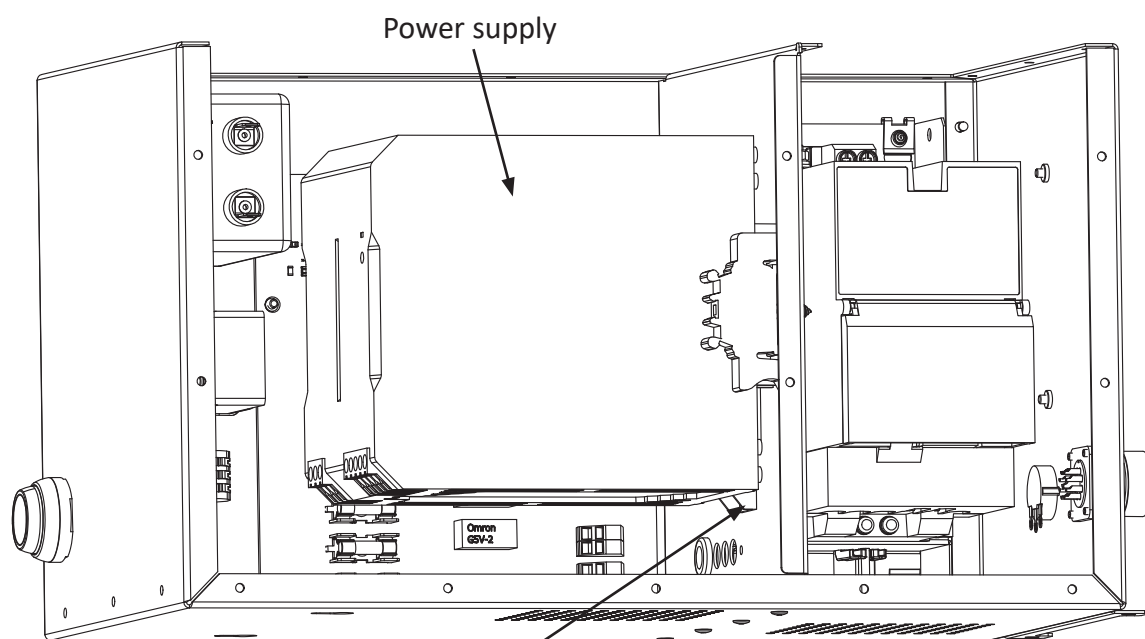


## 6.27 EI-Unit - replace fuses

The fuses are placed on a PCB inside the EI-Unit. See figures below for how to open the box, and figure on the next page for the fuses. Remember to disconnect the mains cable first!



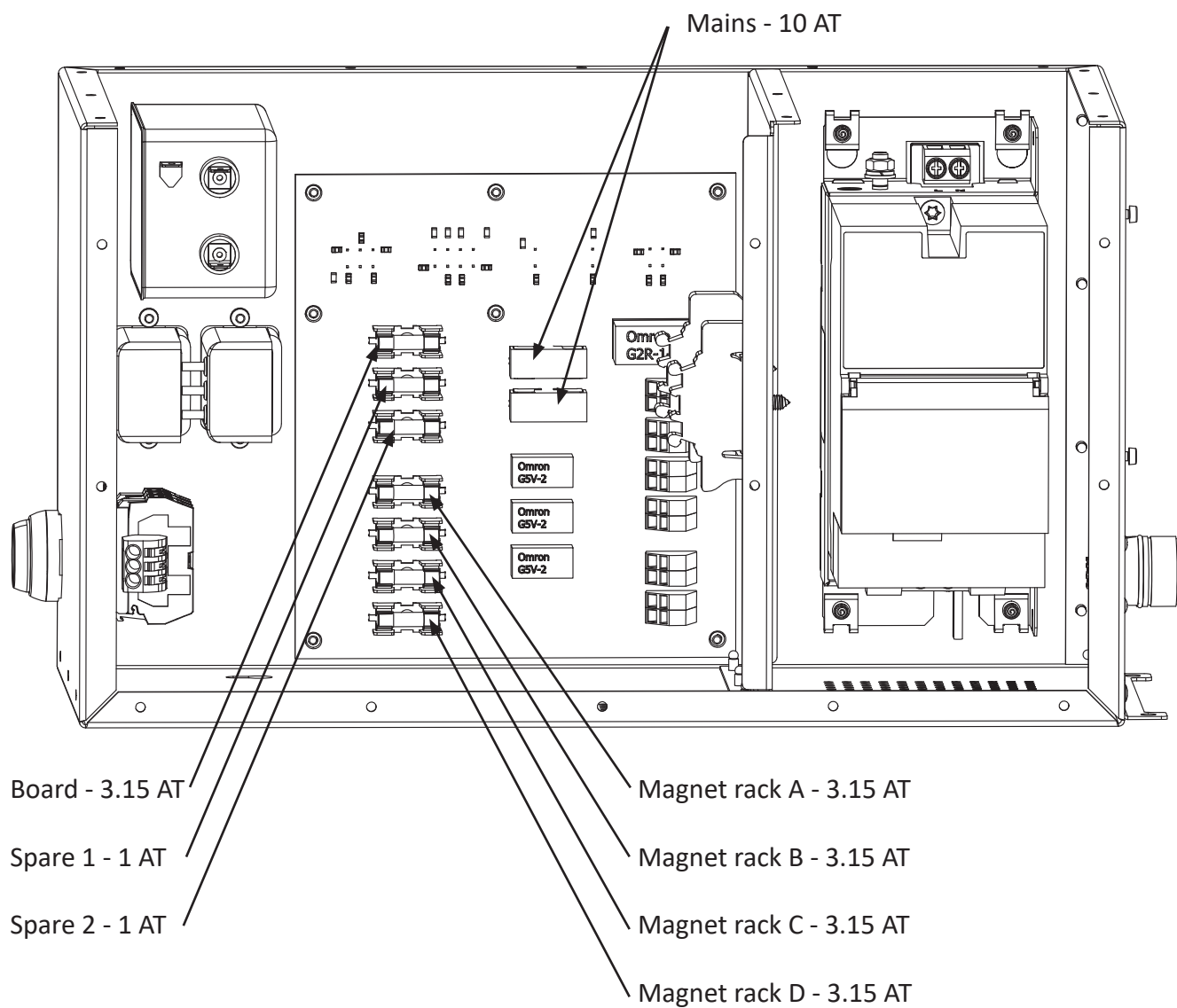
To get more room to inspect and replace the fuses, it's best to move the power supply a little out of the way. This can be done without disconnecting the wires. See figure below.



To release the power supply, place a screw driver here and pull the latch downwards

## The fuses

Note that the two mains fuses are placed under transparent lids. All the fuses are 5 x 20 mm and can be of glass or ceramic type.

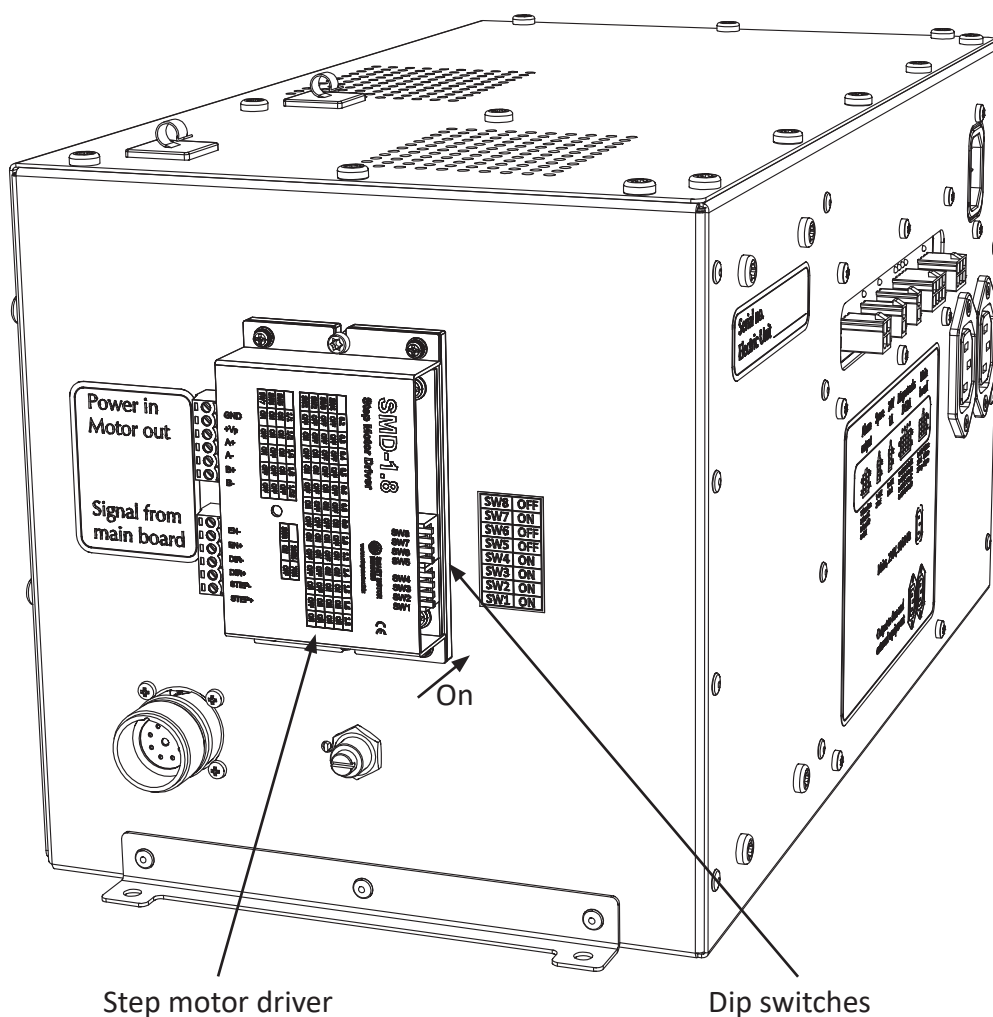


## 6.28 Step motor driver Dip switches

The step motor driver is configured with the dip switches that is placed on the side of the driver. Switch no. 1 is lowest and switch no. 8 is at the top. The switches are 'On' when the lever is pushed in towards the El-Unit.

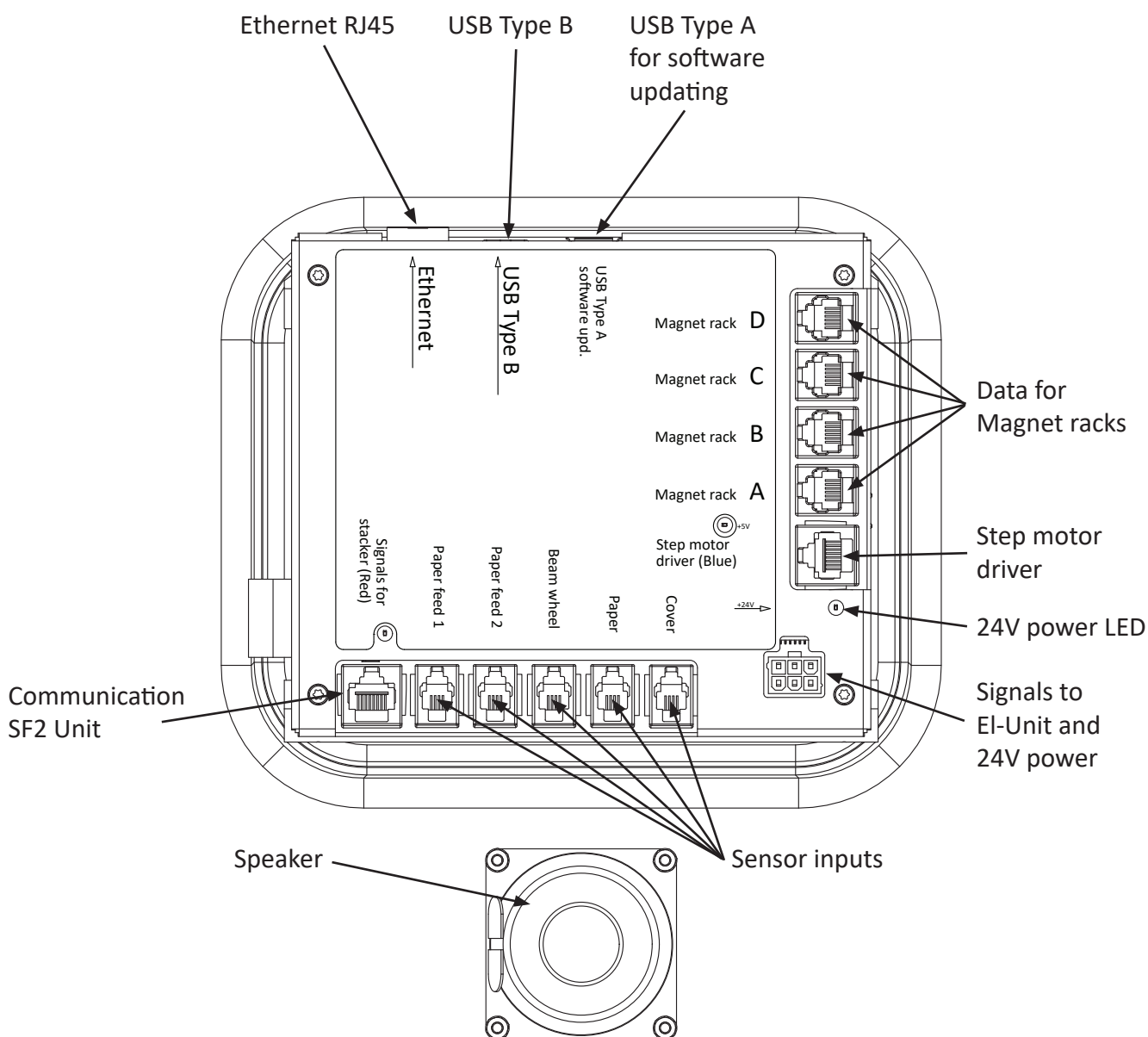
The default Dip switch settings are:

Switch 8	Off
Switch 7	On
Switch 6	Off
Switch 5	Off
Switch 4	On
Switch 3	On
Switch 2	On
Switch 1	On



## 6.29 Main board - connections

The main board is placed just behind the operating panel



## 6.30 Maintenance

### Weekly (without taking the cover off)

Does the printer print correct braille?

How is the braille dot quality?

Check for any damages on the outside of the cover.

Is the operating panel functioning?

Do the fans work? Are the fans clean?

If there is a lot of dust from the paper on the paper guides, use a vacuum cleaner.

### Every 250 hours or six months

All of the weekly maintenance.

Is the printer mechanism, EI-Unit, base plate and so on clean? Use a vacuum cleaner to remove the dust.

Check the main belt for wear, tear, cracks and check the tension.

Check the tractor belts for wear, tear, and cracks. Be sure to check the small spikes of the tractor belts very carefully.

Clean the magnet racks.

Check the sponge list for the long pivot arms on all four magnet racks, the sponge list should be able to keep the long pivot arms pressed against the support list.

When putting the magnet racks back in, check all the magnet rack adjustments.

Check if the printing pins move freely, and if not, clean the printing pin guide.

### Every 500 hours or twelve months

All of the 250 hours or six months maintenance.

Check all four sponges for the short pivot arms, the sponge should be able to keep the short pivot arm pressed all to the end of its travelling distance.

Check the wear on the push rod (12 x 56). This can be measured with a caliper, and the length must be between 55.90 and 56.00 mm.

Check if the paper shoes are worn. The printer should be able to give good braille dot quality, but if not, worn paper shoes could be the reason.

Check the length on the printing pin. This can be measured with a caliper, and the length must be between 64.40 and 64.50 mm.

Lubricate all the stroke ball bearings, using a universal grease with molybdensulfid.

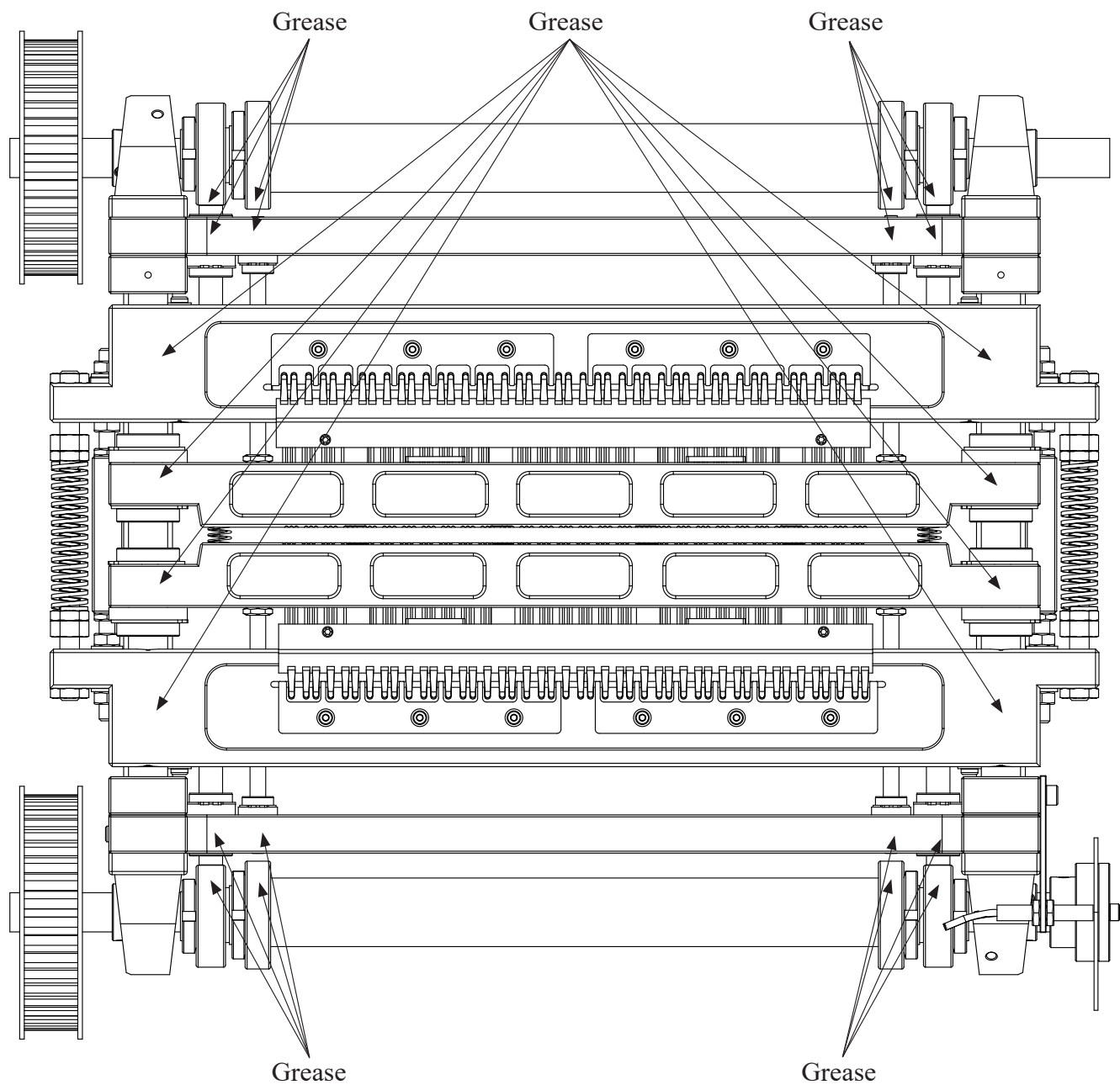
Lubrication should be done as shown in the figure on the next page.

## Lubrication

This should be done every 500 running hours, or approximately once a year.

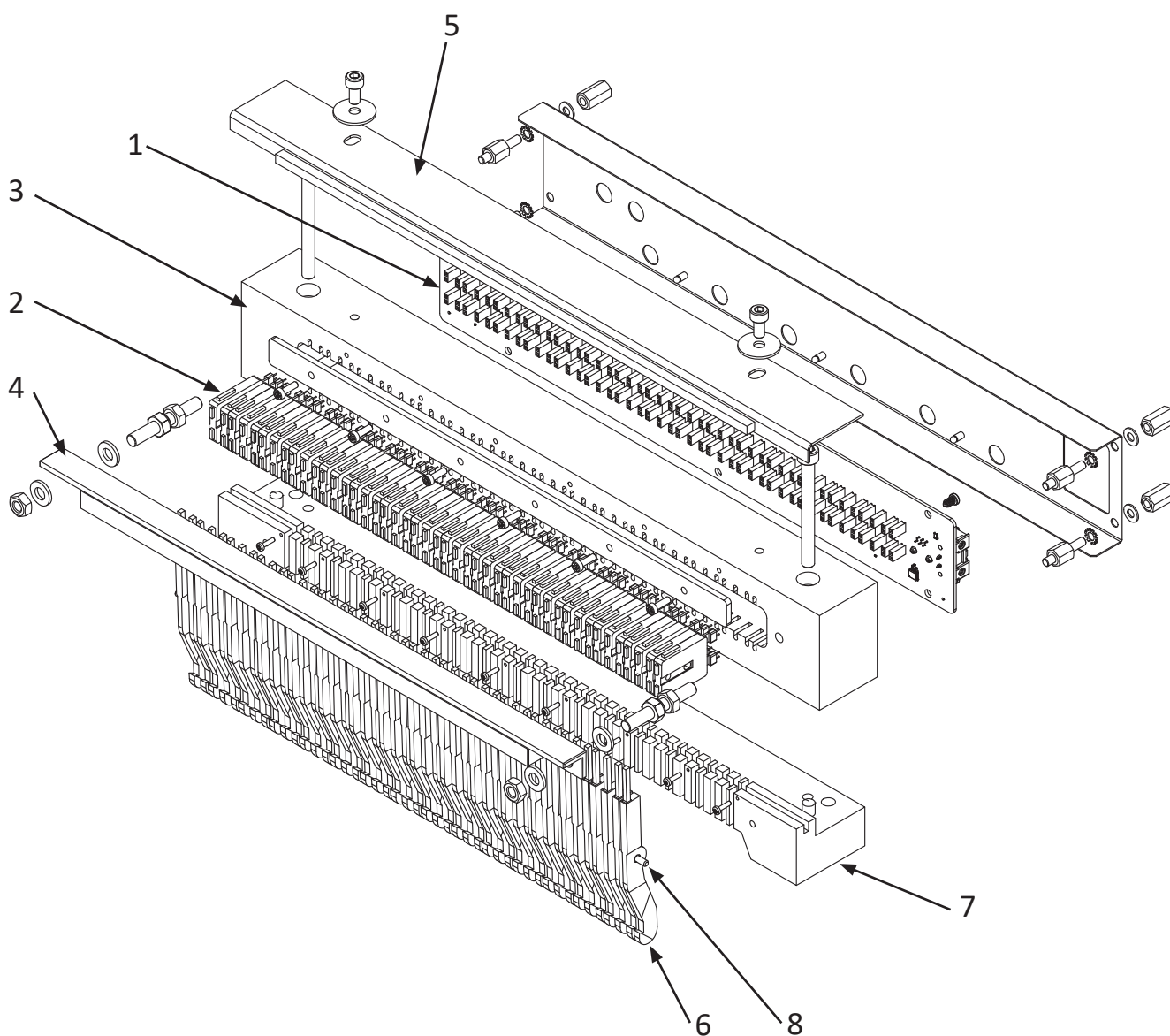
Lubricate all items marked "Grease" on the figure below. (These are the only locations in the printer grease may be applied!).

Use a universal grease with molybdensulfid.



## 7. PARTS - EXPLODED VIEWS

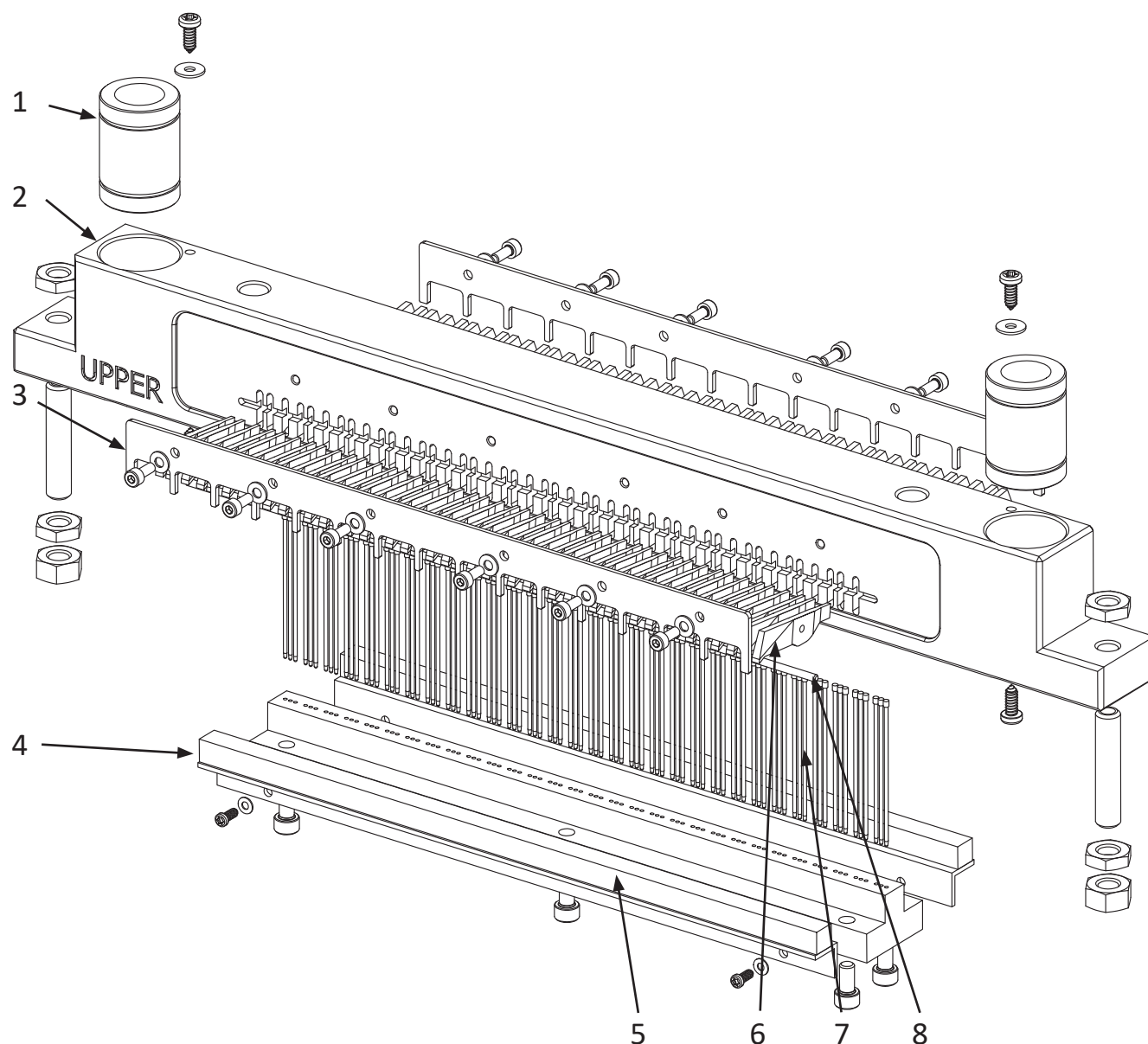
### 7.1 Magnet rack



#### SW985-40893, Magnet rack 45 2.1 assembly

Pos.	Part no.	Name	Quantity per. rack
1	60-60373	Magnet rack board 45 2.1	1
2	B3985-30191	Magnet	45
3	SW985-40882	Magnet rack	1
4	SW985-40886	Support list, magnet rack	1
5	SW985-40885	Sponge list SW compl 5x5	1
6	B3985-40690	Pivot arm, long, Type F, Green	45
7	SW985-40881	Guide list, magnet rack	1
8	SW985-40815	Shaft, long pivot arm, Ø3x309	1

## 7.2 Beam



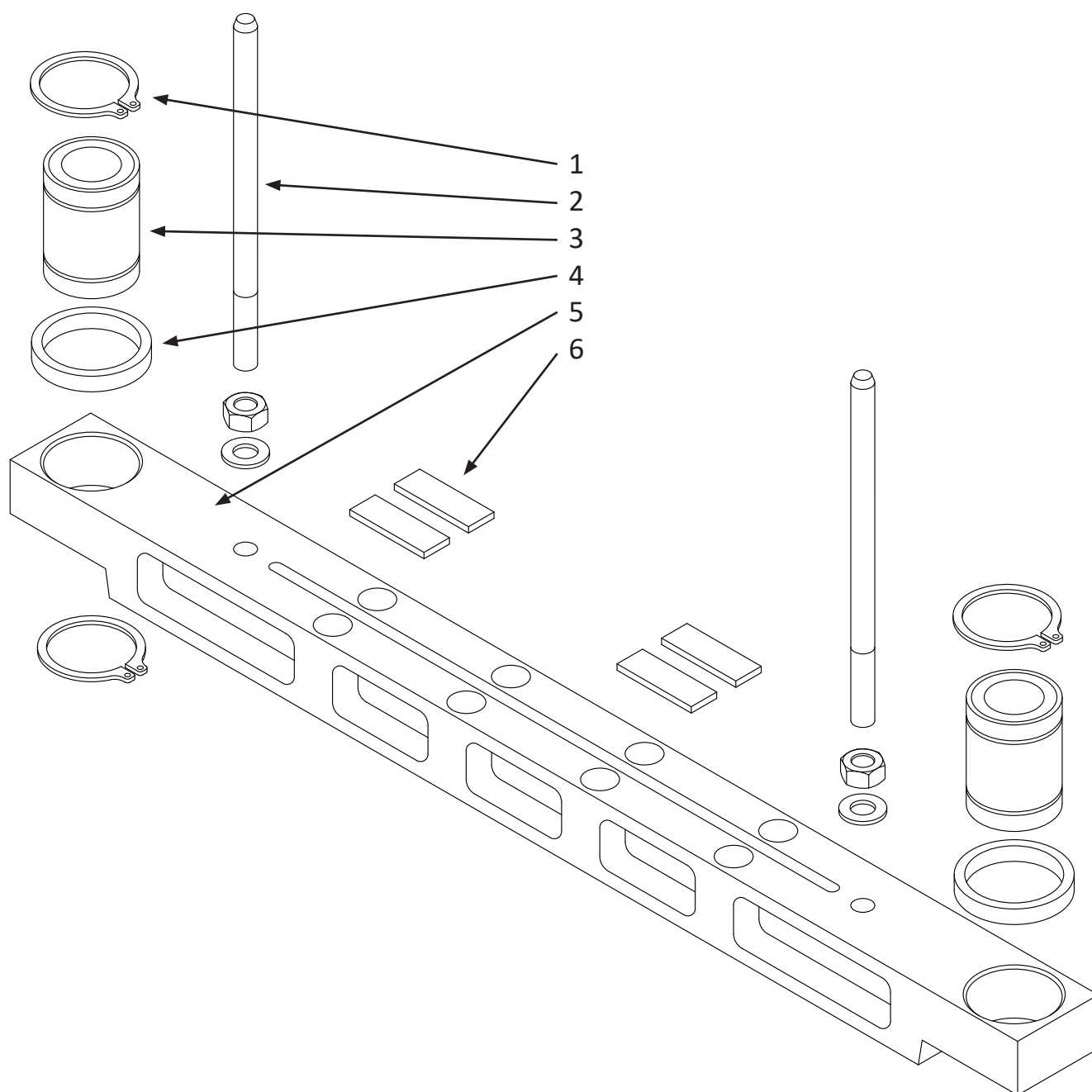
**SW985-40819, Beam upper assembly**

**SW985-40810, Beam lower assembly**

Pos.	Part no.	Name	Quantity per. beam
1	MA500-50001	Stroke ball bearing Ø20	2
2	SW985-40811	Beam, upper	1
2	SW985-40812	Beam, lower	1
3	SW985-40813	Fastener for short pivot arm shaft	2
4	SW985-40817	Sponge list for short pivot arm	2
5	60-65628	Pin guide	1
6	B3985-4016E	Pivot arm, short, Type E, Green	90
7	B3985-40150	Printing pin, length = 64.5 mm	90
8	SW985-40815	Shaft, short pivot arm Ø3x309	2



### 7.3 Paper shoe



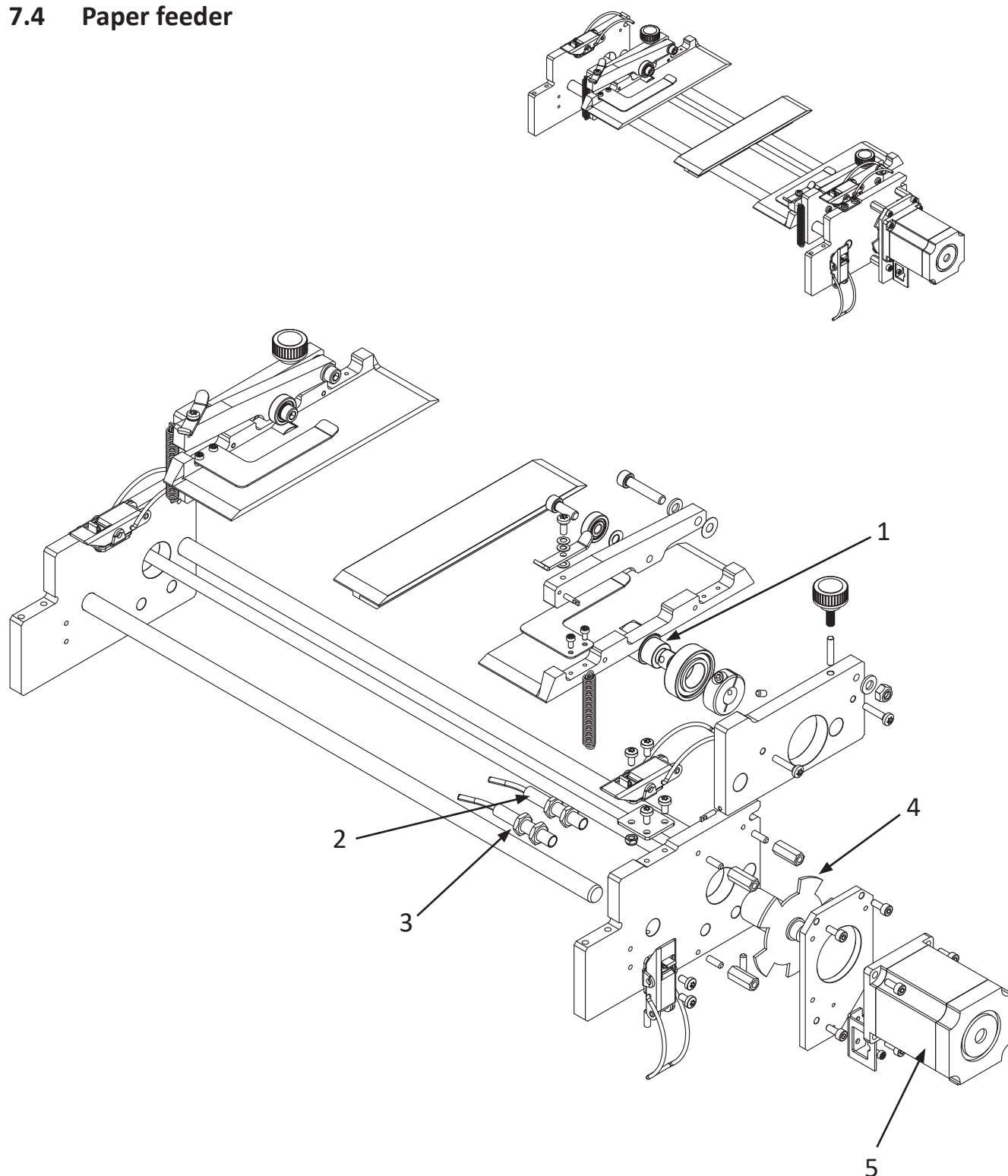
**60-65629, Paper shoe, upper assembly**

**60-65630, Paper shoe, lower assembly**



Pos.	Part no.	Name	Quantity per. shoe
1	MA510-10003	Retaining ring	4
2	B3985-40720	Adjustment screw (push rod) Ø8x140	2
3	MA500-50001	Stroke ball bearing Ø20	2
4	B3985-40913	Spacer	2
5	60-65627	Paper shoe upper	1
5	60-65626	Paper shoe lower	1
6	B3985-40722	Plastic shims	4

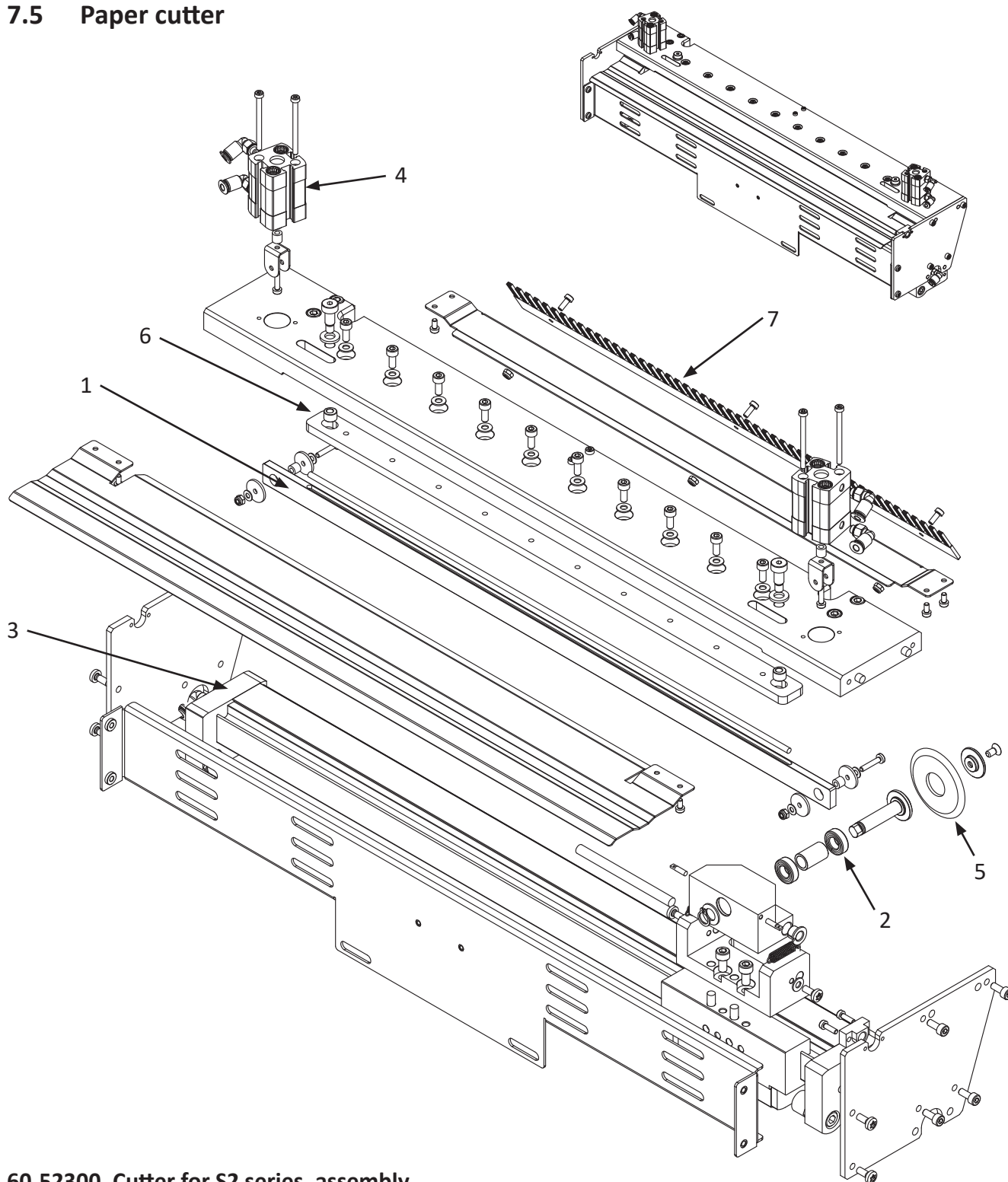
## 7.4 Paper feeder



### 60-51300, Feeder for S2 series, assembly

Pos.	Part no.	Name	Quantity
1	SR975-51004	Pulling wheel	2
2	10-61966	Paper feed sensor no. 1	1
3	10-61967	Paper feed sensor no. 2	1
4	60-51250	Timing wheel with hub	1
5	EA185-00025	Stepper motor	1

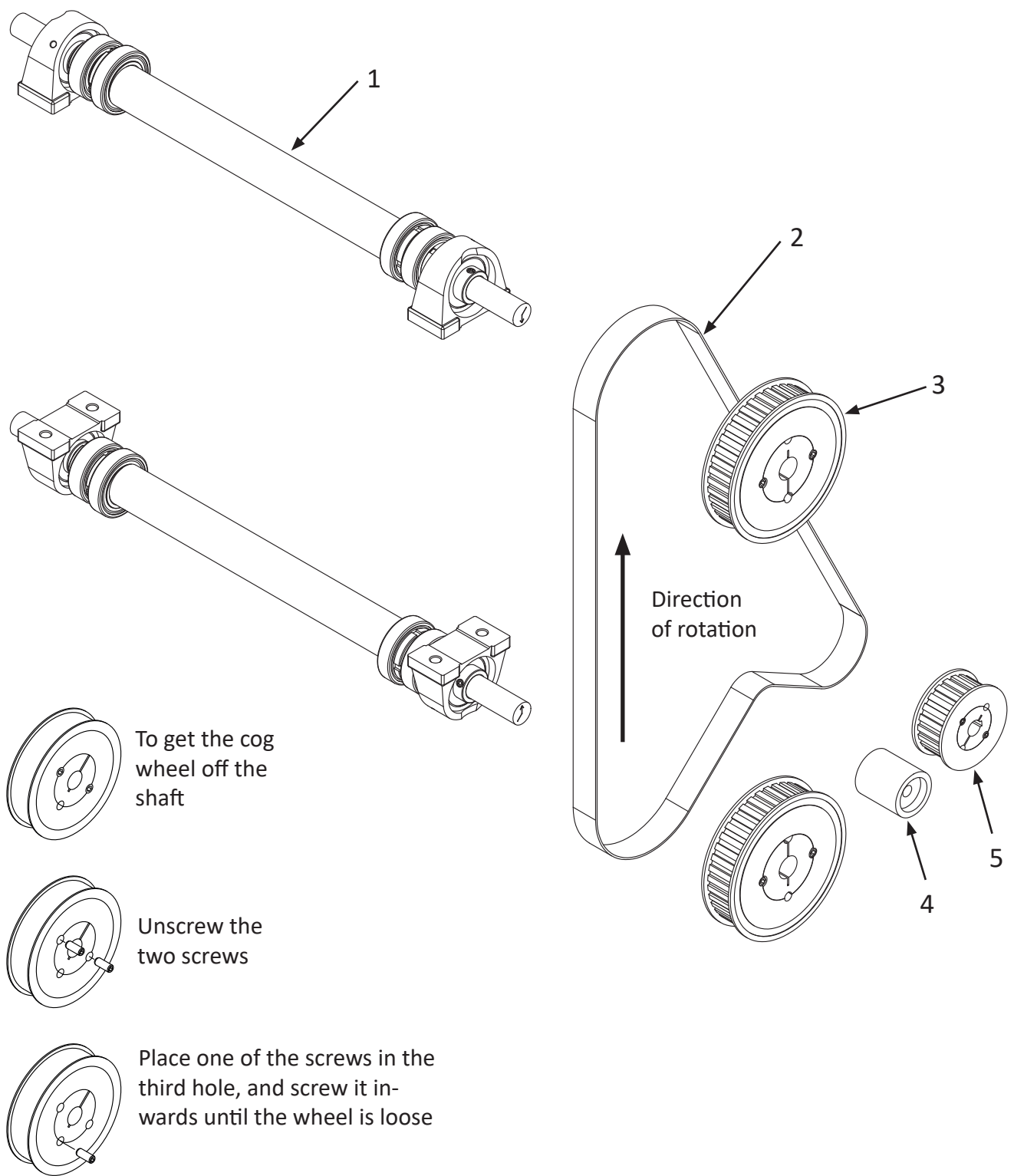
## 7.5 Paper cutter



**60-52300, Cutter for S2 series, assembly**

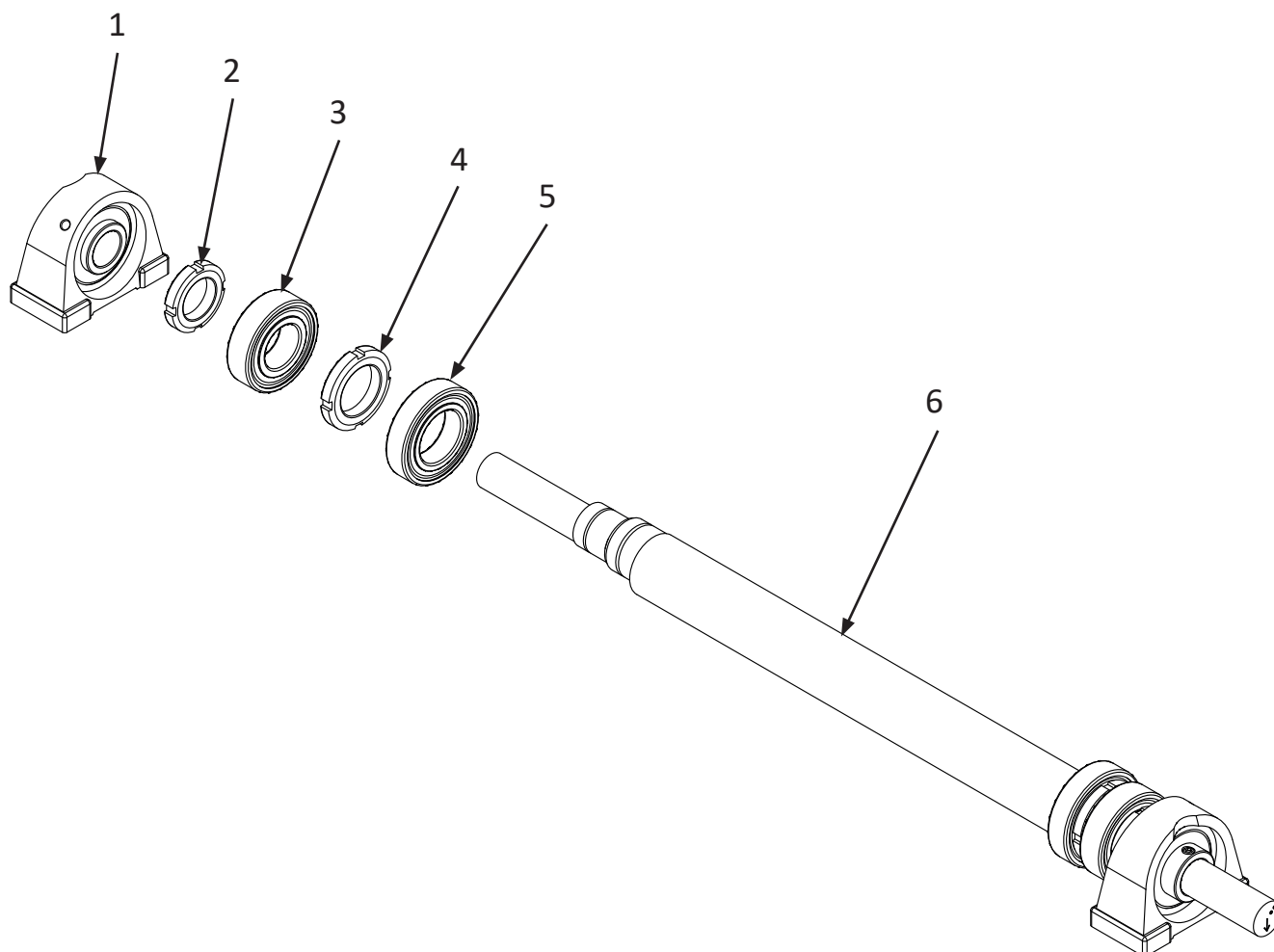
Pos.	Part no.	Name	Quantity
1	60-52312	Paper clamp	1
2	MA500-10007	Bearing 688 2Z	2
3	MA525-10026	Cutter cylinder	1
4	MA525-10027	Paper clamp cylinder	2
5	MA599-00002	Roller blade	1
6	PK980-52105	Fixed blade	1
7	SR970-52047	Antistatic brush	1

7.6 Shafts, belt



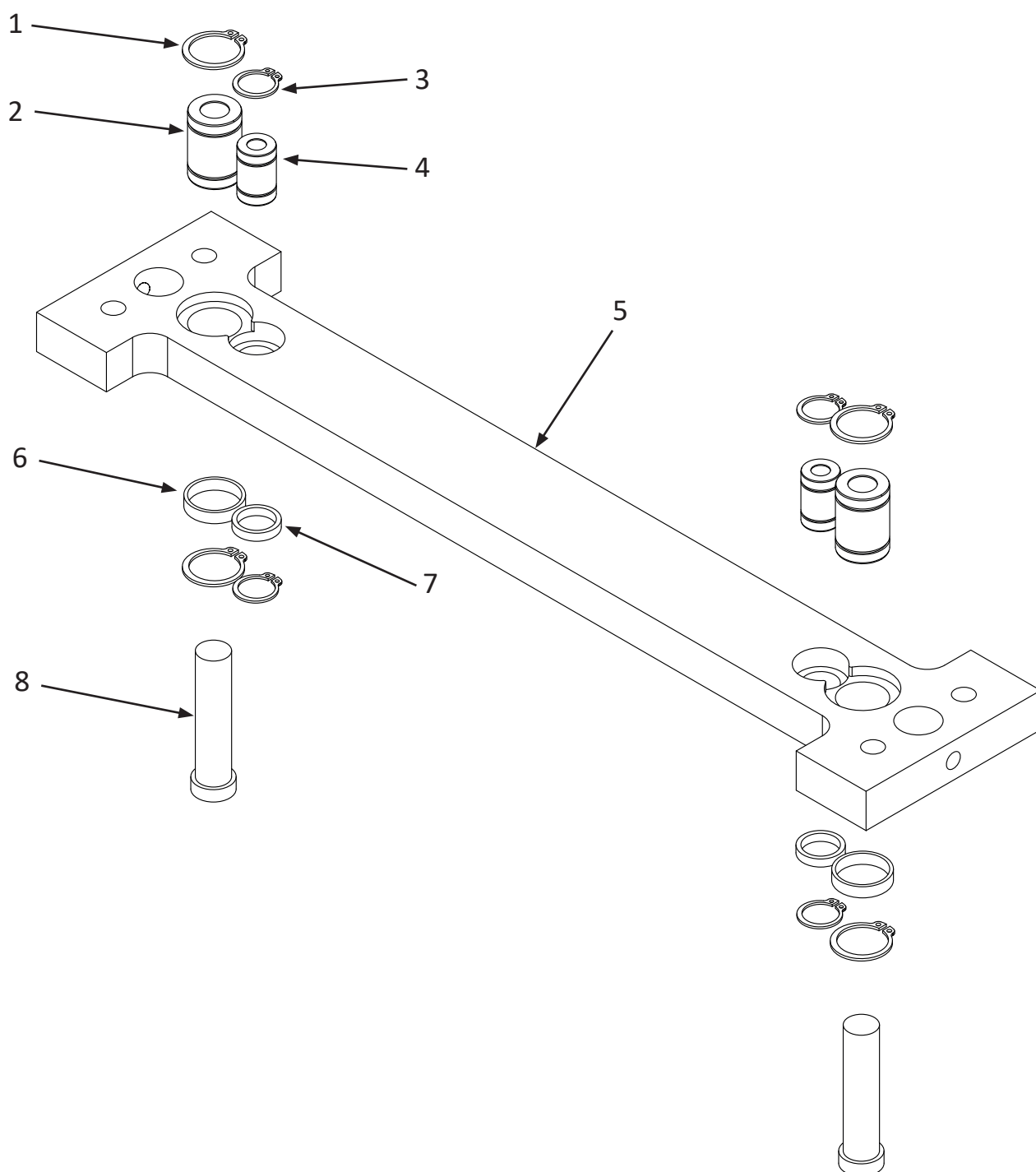
Parts shaft, belt

Pos.	Part no.	Name	Quantity
1	60-65623	Shaft, complete with bearings	2
2	MA505-20003	Belt 540 L	1
3	MA505-10004	Cog wheel 40 L 100	2
4	MA505-40001	Belt tensioner	1
5	MA505-20008	Cog wheel 22 L 100	1

**Shaft, exploded view****60-65623, Shaft assembly**

Pos.	Part no.	Name	Quantity per. shaft
1	MA500-20002	Main bearing with housing (not part of 60-65623)	2
2	MA443-30001	Nut KM5	2
3	MA500-10002	Bearing outer eccentric 6205 2Z	2
4	MA443-30002	Nut KM6	2
5	MA500-10001	Bearing inner eccentric 6006 2Z	2
6	60-65620	Main shaft SW	1

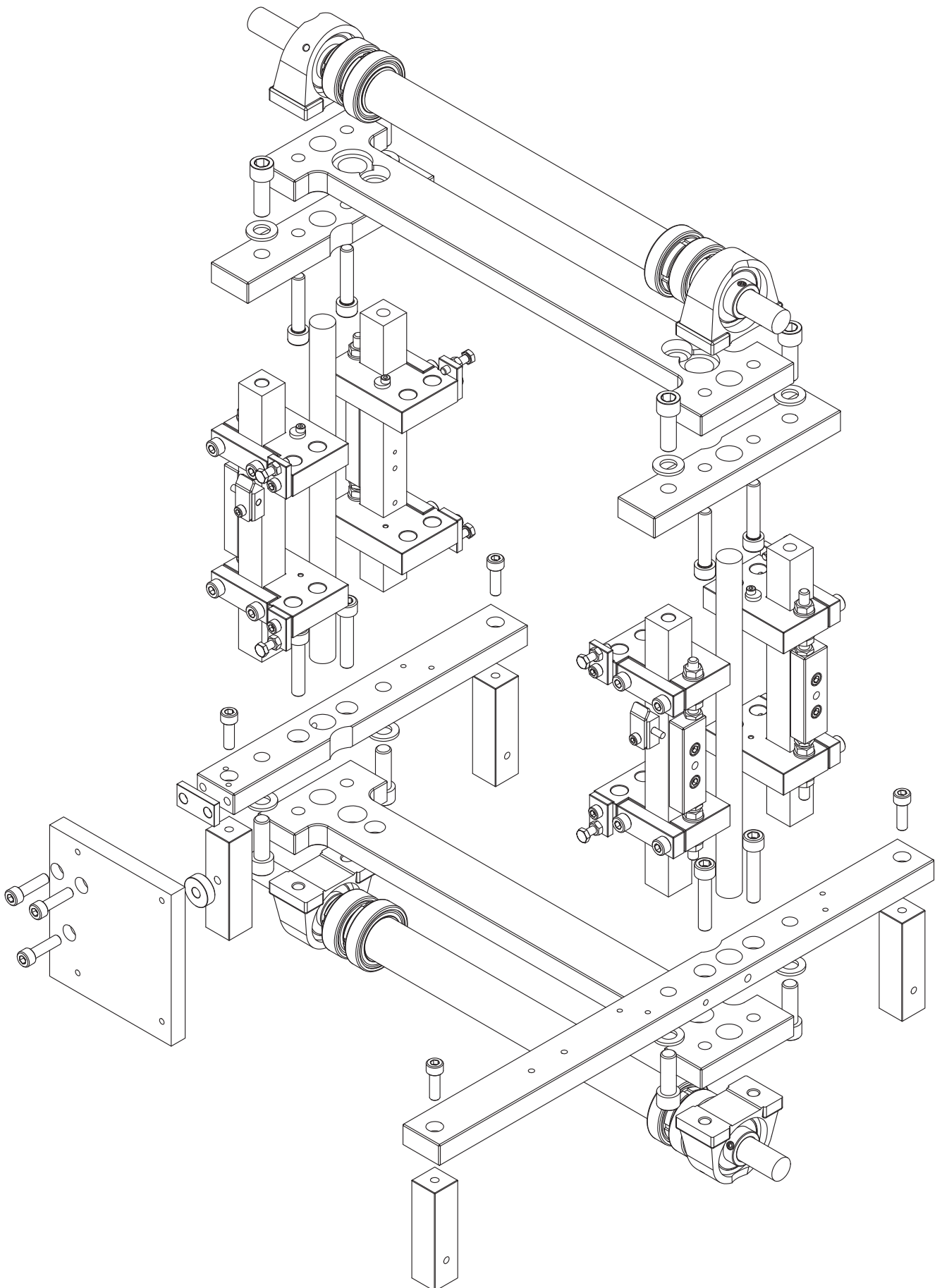
## 7.7 Top and bottom frame



### 60-65624, Top and bottom frame assembly

Pos.	Part no.	Name	Quantity per. frame
1	MA510-10002	Locking ring Ø22	4
2	MA500-50002	Stroke ball bearing Ø12	2
3	MA510-10001	Locking ring Ø16	4
4	MA500-50003	Stroke ball bearing Ø8	2
5	60-65621	Frame SW	1
6	B3985-40912	Spacer Ø22	2
7	B3985-40911	Spacer Ø16	2
8	10-60032	Push rod ceramic Ø12x56 (not part of 60-65624)	2

## Frame, complete



## 8. SF2 UNIT

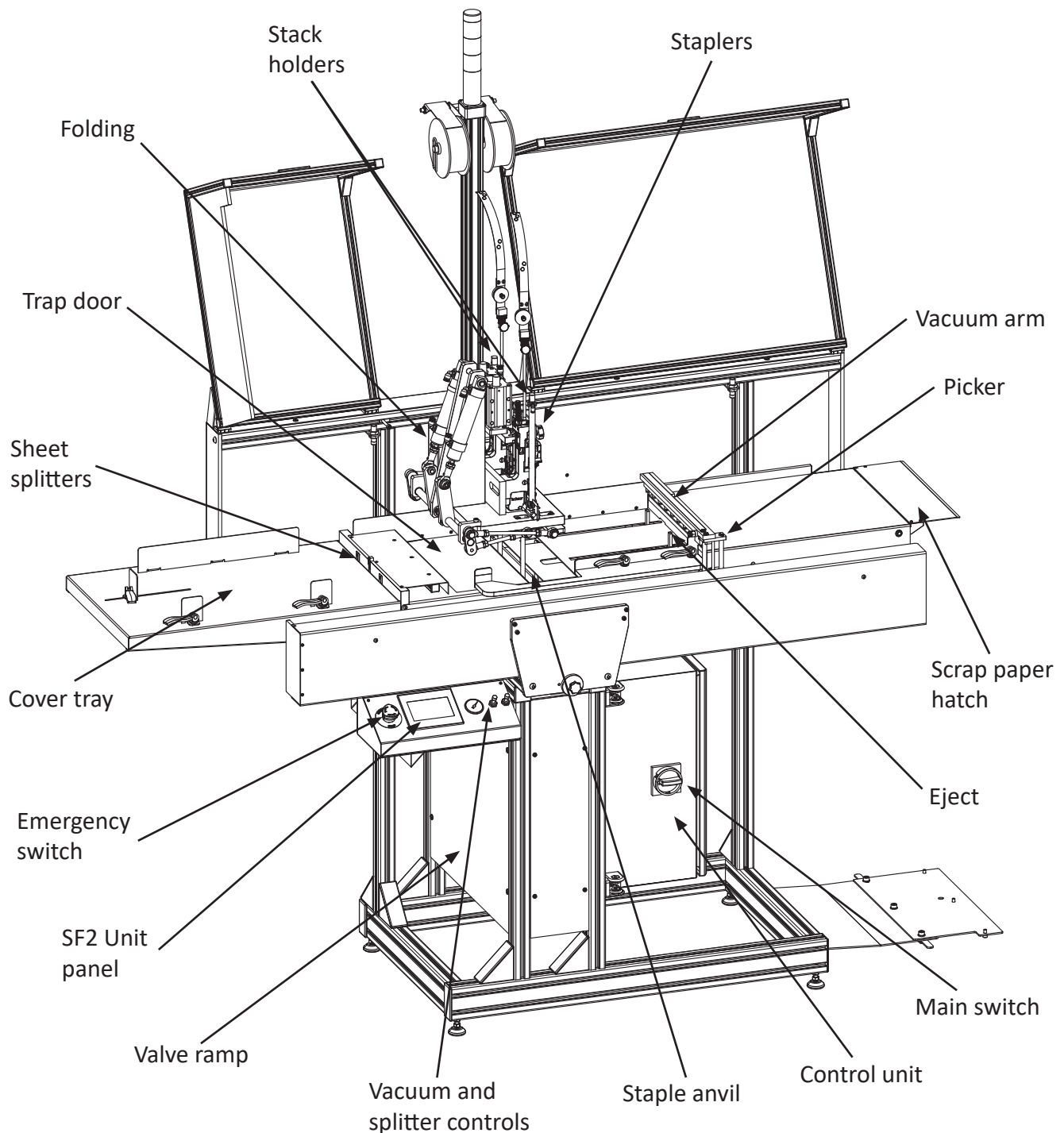
The SF2 Unit can be divided into different functions, see the figure below.

Note! The protection cover that is normally fitted over the folding and stapling unit's removed for clarity in the figure.



Note! There is crushing hazard on the SF2 Unit!

Turn off the SF2 Unit Main switch before assembling, maintenance, and repair!





## 8.1 SF2 Unit - description of functions

The print job starts when a file is sent from the computer to the printer. This file will contain both text and codes for the different settings on the printer. The codes can for example be the number of sheets in the book, the line length, margins and so on.

The printer will then calculate the sheet size based on this information, and send it to the SF2 Unit, that will adjust the paper guides and staplers to the corresponding position.

Then the printer motor starts and the printing begins.

Next thing to happen is that the Scrap paper hatch opens so the piece of paper in front of the first sheet will fall into the waste bin.

When the first sheet is printed, it's time to cut the paper. The printer sends a signal to the SF2 Unit control unit, and the paper holder will lock the paper in place and the cutter will cut the sheet.

As soon as the sheet is loose, it will be picked up and transported to the stapling area by the vacuum arm.

This is repeated until the number of sheets per volume is reached. Then the vacuum arm will move to the cover tray and pick up a cover (if the cover option is selected). The cover is placed on top of the stack of sheets and the stapling and folding takes place.

Next, the trap door will open, the book will be pushed out by the eject and the trap door will close again.

Here are the different functions a little explained, see also the figure on the previous page.

### - Scrap paper hatch

To ensure that the first sheet in a document has the correct size, the cutter will cut off a strip of paper before the first sheet. The Scrap paper hatch will open and the paper strip will be pushed out and fall into the waste bin. See section [“8.2 Scrap paper hatch” on page 143](#) for more information.

### - Picker

Consists of a motor that will move the vacuum arm back and forth, and a pneumatic cylinder that moves the arm up and down. Used to pick up the printed sheets and move them into the folding and stapling position, and to move the covers to the pile. See section [“8.3 Picker” on page 144](#) for more information.

### - Vacuum arm

An arm with suction cups that is fitted on the Picker. Used to lift and move the printed sheets and eventually magazine covers. See section [“8.4 Vacuum arm” on page 145](#) for more information.

### - Sheet splitters

Used to ensure that only one cover sheet in the cover pile is picked up when the vacuum arm is picking up the cover, there are air nozzles that will blow air into the pile to help separate the sheets. See section [“8.5 Sheet splitters” on page 146](#) for more information.

### - Vacuum and splitter controls

Two regulators and one gauge, one regulator and the gauge are used to control the amount of vacuum in the vacuum arm, and the other regulator is controlling the amount of air used in the sheet splitters. See section [“8.4 Vacuum arm” on page 145](#) and [“8.5 Sheet splitters” on page 146](#) for more information.

**- SF2 Unit operating panel**

The touch panel is used to control the different settings for the SF2 Unit. See section [“5. OPERATING THE SF2 UNIT” on page 73](#) for more information.

**- Emergency switch**

An emergency switch that will remove the electrical power to the servo motor and the compressed air supply on the SF2 Unit when engaged.

**- Stack holders**

Two pneumatic cylinders that will hold the stack of sheets in place while the stapling and folding takes place. See section [“8.6 Stack holders” on page 147](#) for more information.

**- Stapling**

There are two heavy duty stapling machines that works in parallel and puts two staples into the pile of sheets at the same time. Uses string from rolls as staple material. See section [“8.7 Stapling” on page 148](#) for more information.

**- Staple anvil**

The staple anvil is shaped like a thin plate with small grooves to bend the staplers. Will be pressed up against the pile of sheets during stapling, and thereafter lift the pile up into the folding mechanism. See section [“8.8 Staple anvil” on page 149](#) for more information.

**- Folding**

Folds the stack of sheets so it becomes a book. Two pneumatic cylinders works via shafts and levers and creates a high force to squeeze the folded pile of sheets so it keeps the folded form. See section [“8.9 Folding” on page 150](#) and [“8.10 Folding - Adjusting the staple position” on page 151](#) for more information.

**- Trap door**

A hatch that opens when the stapling and folding is done so the finished book can fall out. See section [“8.11 Trap door” on page 152](#) for more information.

**- Eject**

When the stapling and folding is done, the Eject paper guide will help to push the finished book out through the trap door. See section [“8.12 Eject” on page 153](#) for more information.

**- Cover tray**

The place to lay book covers that will be picked up and placed on the braille books.

**- Valve ramp**

This is the central for the pneumatic control, every pneumatic function on the SF2 Unit has a valve here. See section [“8.13 Pneumatic valves” on page 154](#) for more information.

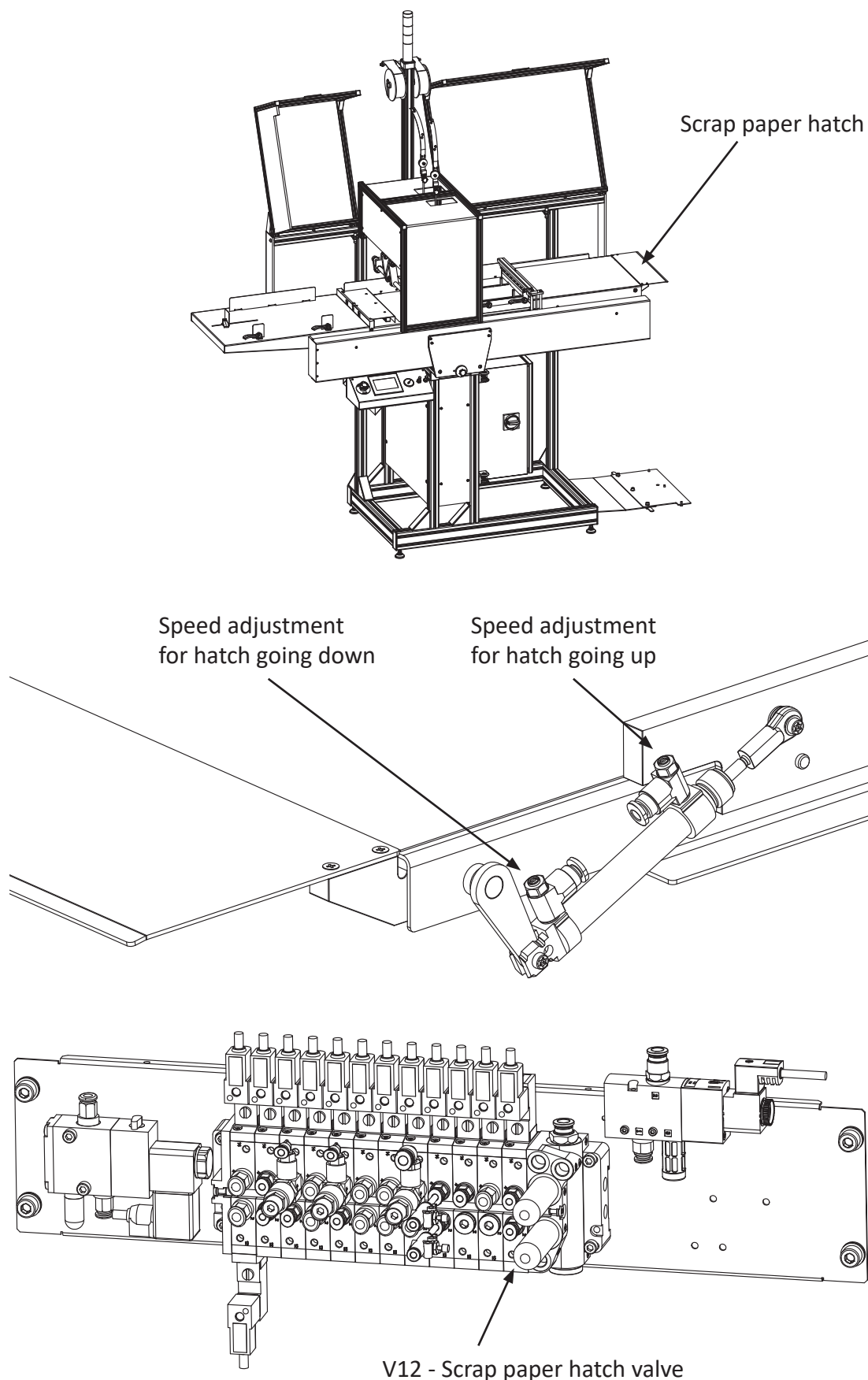
**- Control unit**

Inside the Control unit are the power supplies, relays, electronics etc. See section [“8.14 Components inside the control unit” on page 155](#) for more information.

## 8.2 Scrap paper hatch

Is a hatch that will open so the scrap paper that is cut off at the beginning of a print job can fall down into the waste bin.

The speed the hatch moves up and down can be adjusted with one-way flow control valves fitted on the cylinder.



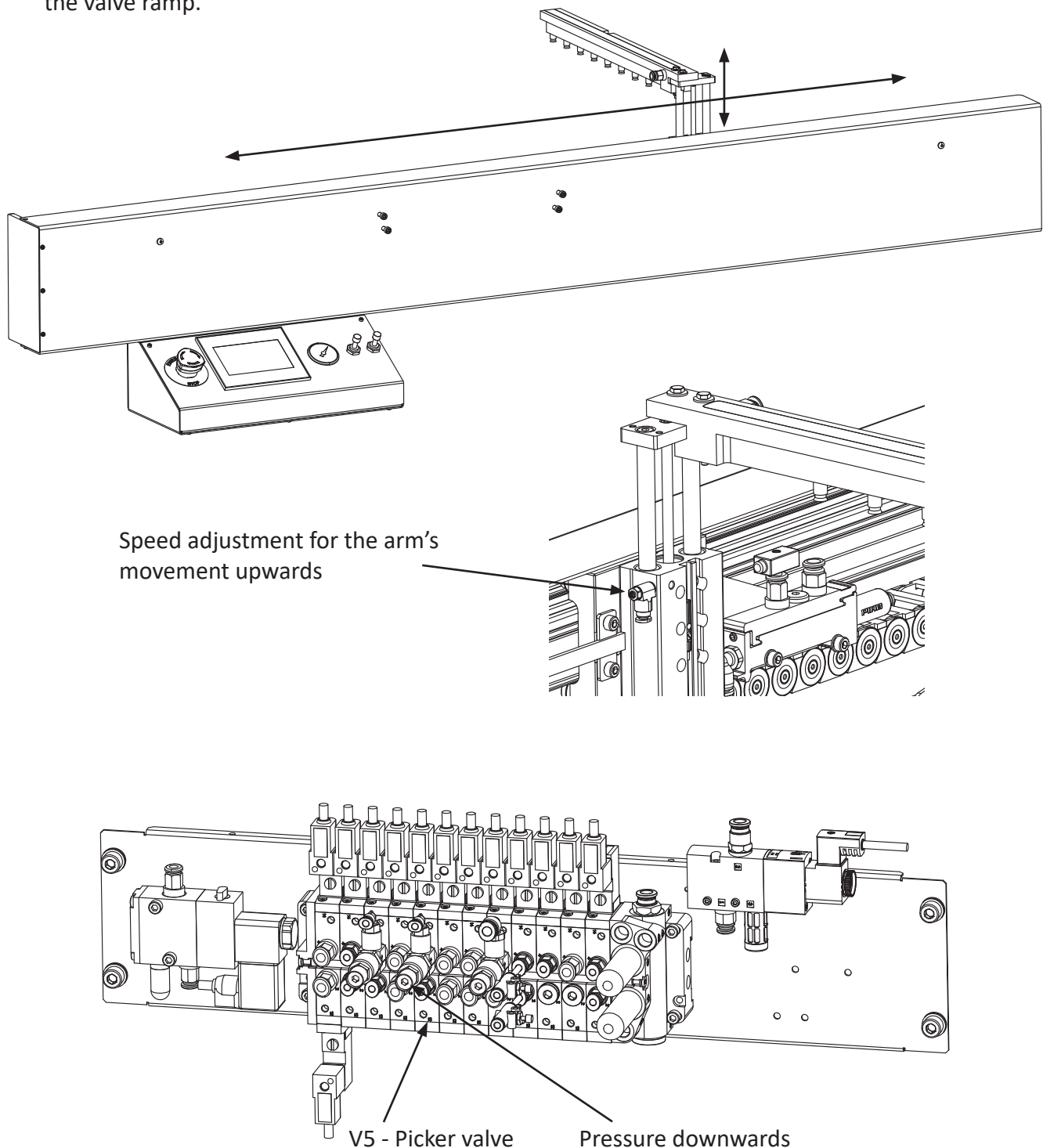
### 8.3 Picker

Consists of a servo motor that will move the vacuum arm back and forth, and a pneumatic cylinder that moves the arm up and down. Used to pick up the printed sheets and move them into the folding and stapling position, and to move the covers to the pile.

The servo motor has different settings that can be changed using the SF2 Unit control panel. See section [“8.15 Reference position on the vacuum arm” on page 156](#) for more information on the servo motor settings.

The up and down movement on the cylinder can also be adjusted:

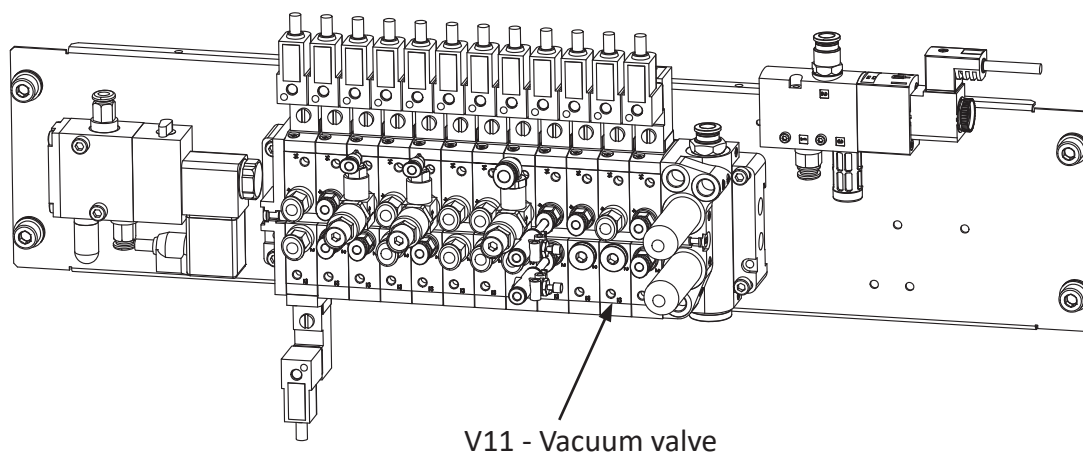
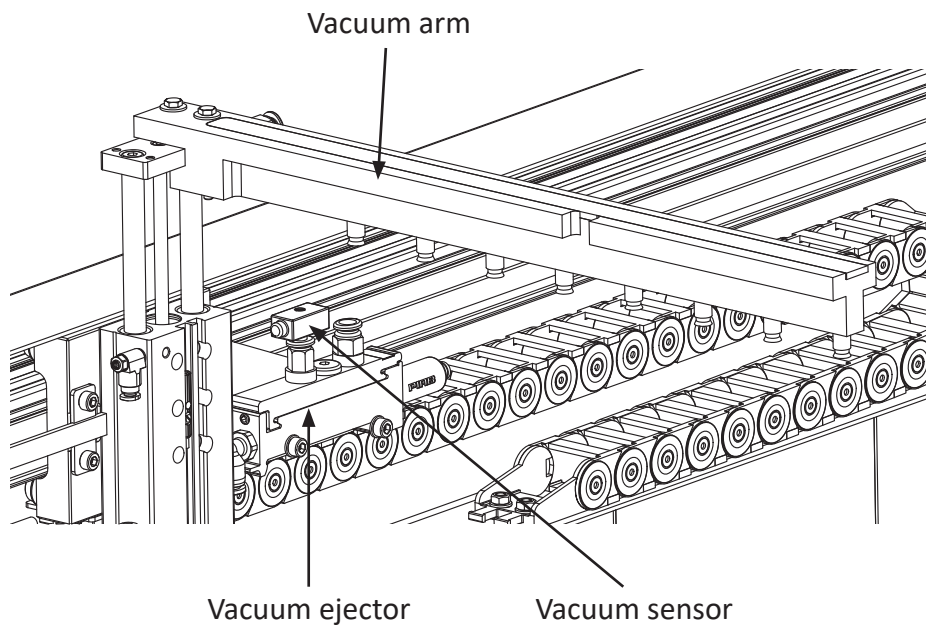
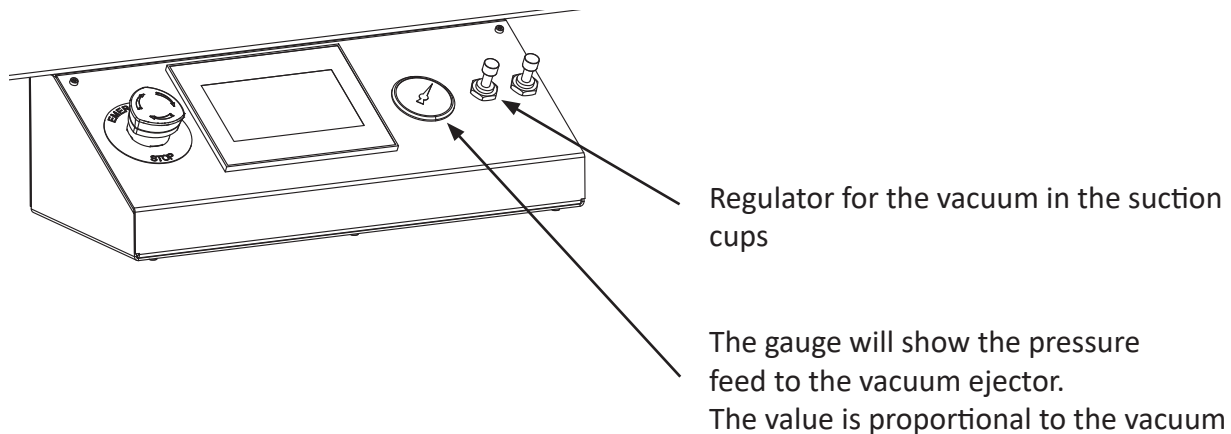
- The upward speed of the arm is adjusted with a one-way flow control valve fitted on the cylinder.
- The force the arm is pushing down against the paper can be adjusted with a pressure regulator on the valve ramp.



## 8.4 Vacuum arm

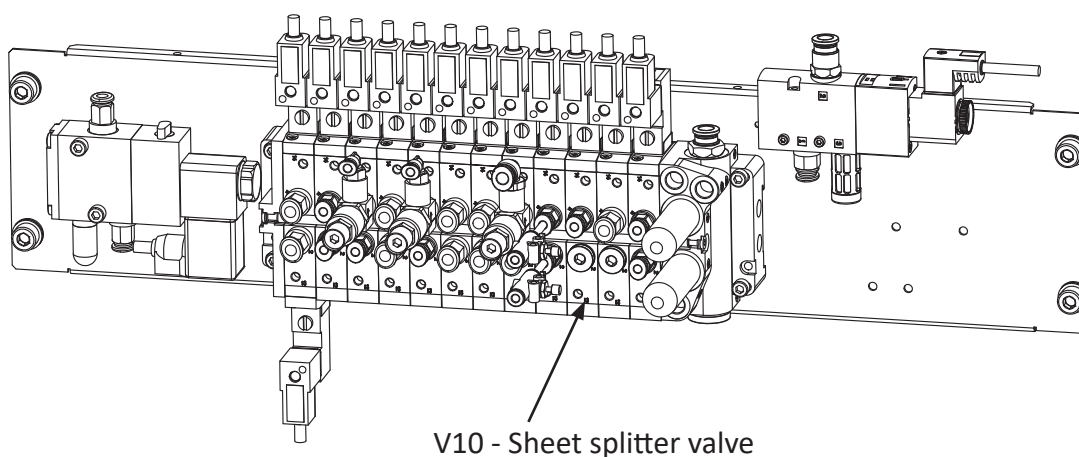
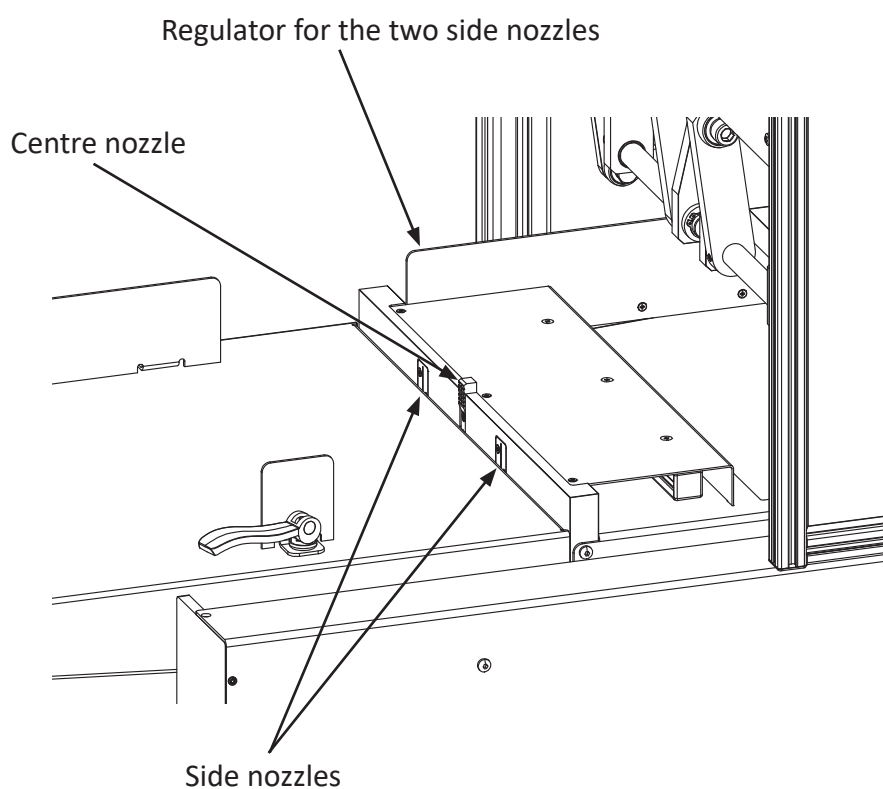
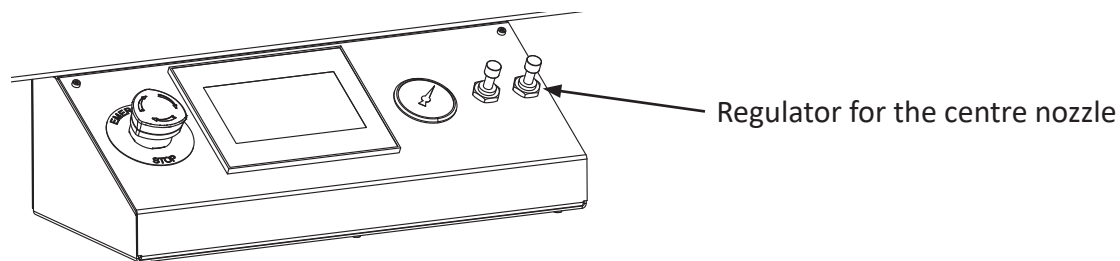
The vacuum arm has 7 suction cups and is used to lift and move the sheets. The vacuum needed is made in an ejector that is placed just beside the vacuum arm.

The vacuum sensor will discover if a sheet falls off the vacuum arm during the movement.



## 8.5 Sheet splitters

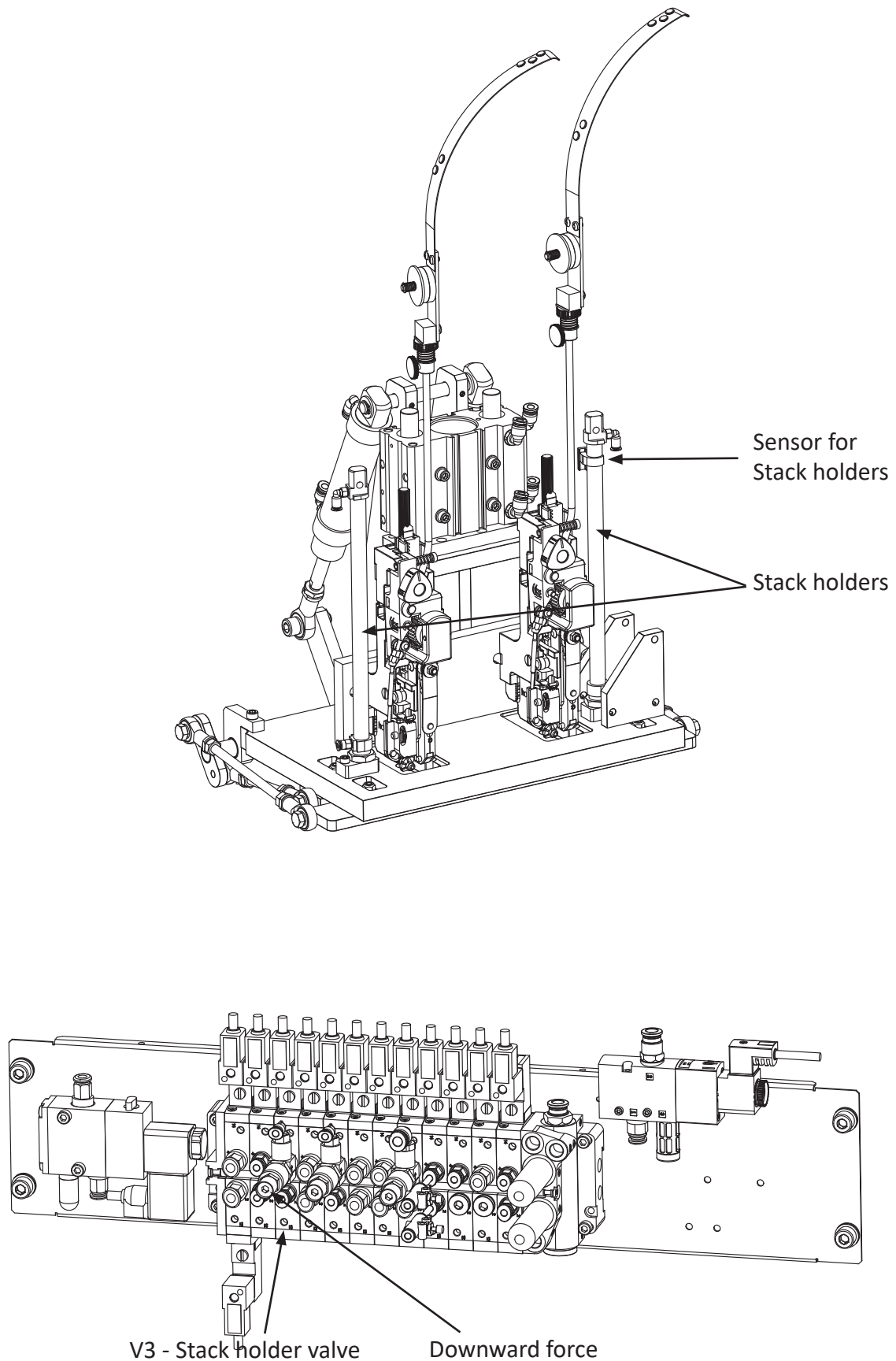
When the vacuum arm is lifting a cover from the pile, the sheet splitters are blowing air into the pile to help separate the sheets. The amount of air in the two nozzles at the sides is controlled by the regulator just behind the cover magazine. The amount of air in the nozzle in the middle is controlled by the regulator on the panel.





## 8.6 Stack holders

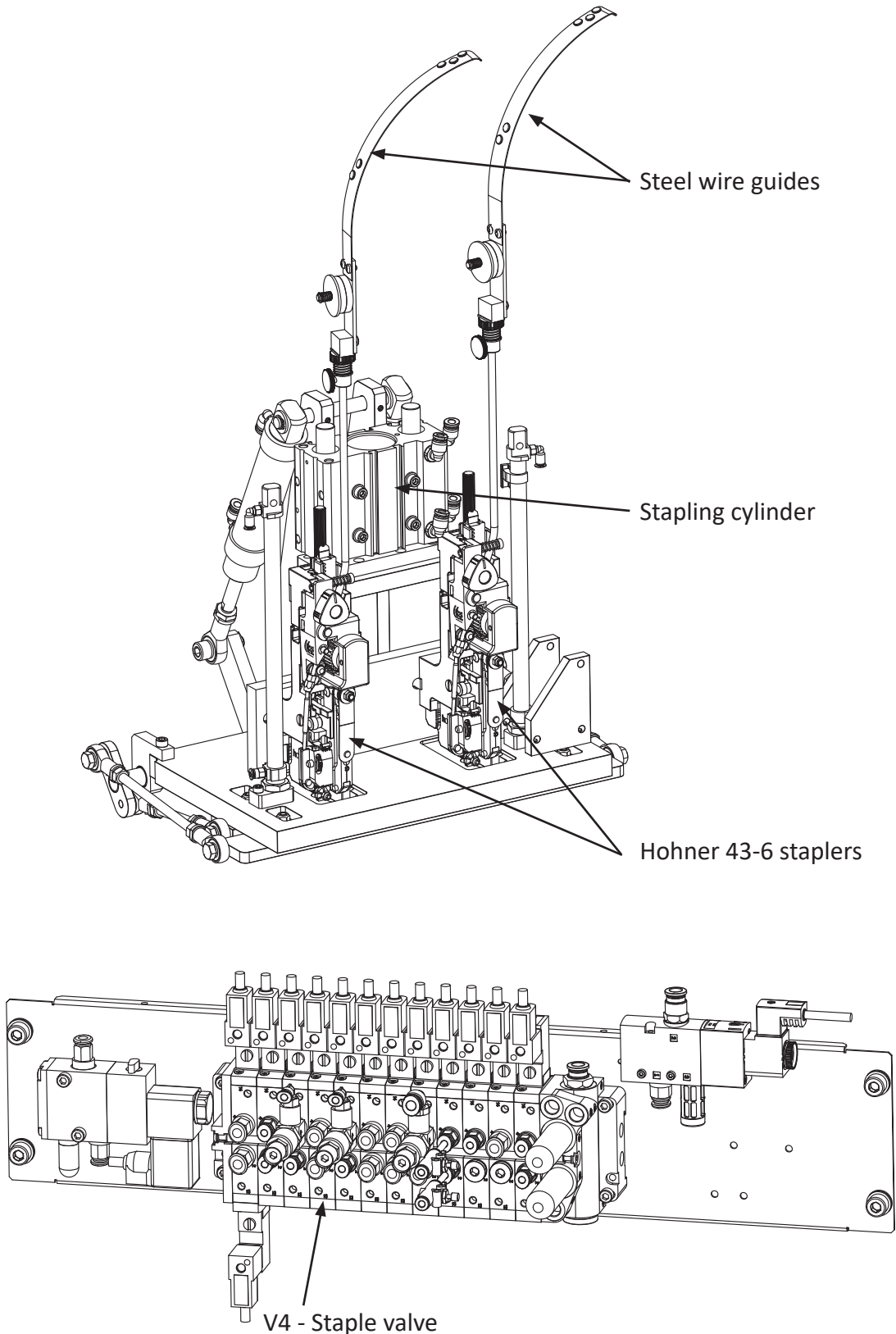
The stack holders are two cylinders that will move down and keep the stack of sheets aligned until the stapling is done. The downward force can be adjusted with the regulator on the valve ramp.



## 8.7 Stapling

The stapling is engaged by the stapling cylinder that goes down and up again. This movement will drive the two Hohner 43-6 staplers to staple at the same time. The stapling is done with 0.5 mm steel wire that the staplers will form, cut, and press through the pile of paper and then crimp it on the underside in one movement.

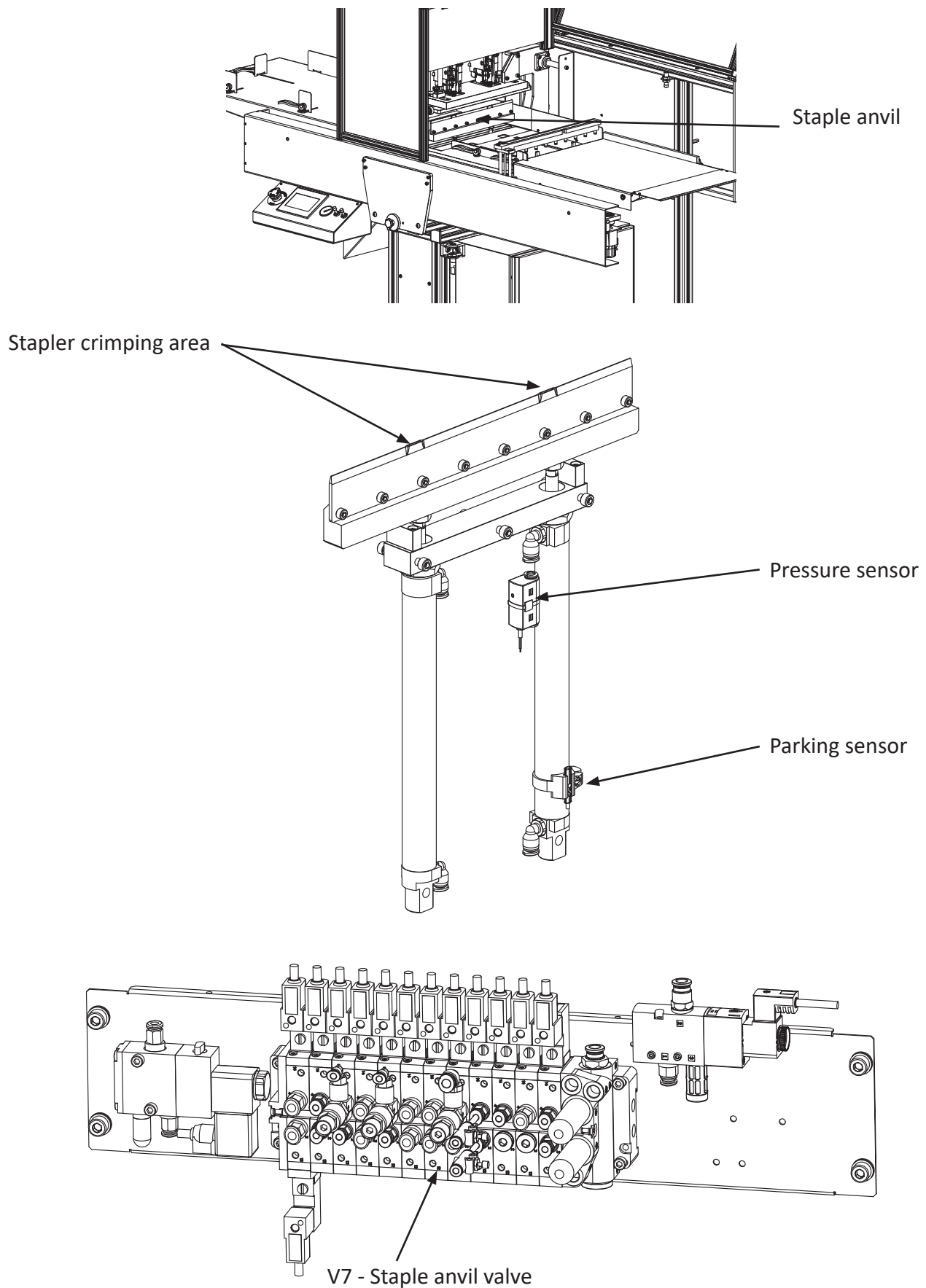
Note! The Hohner staplers have their own user manual, make sure you also read it to understand the different adjustments on the staplers.





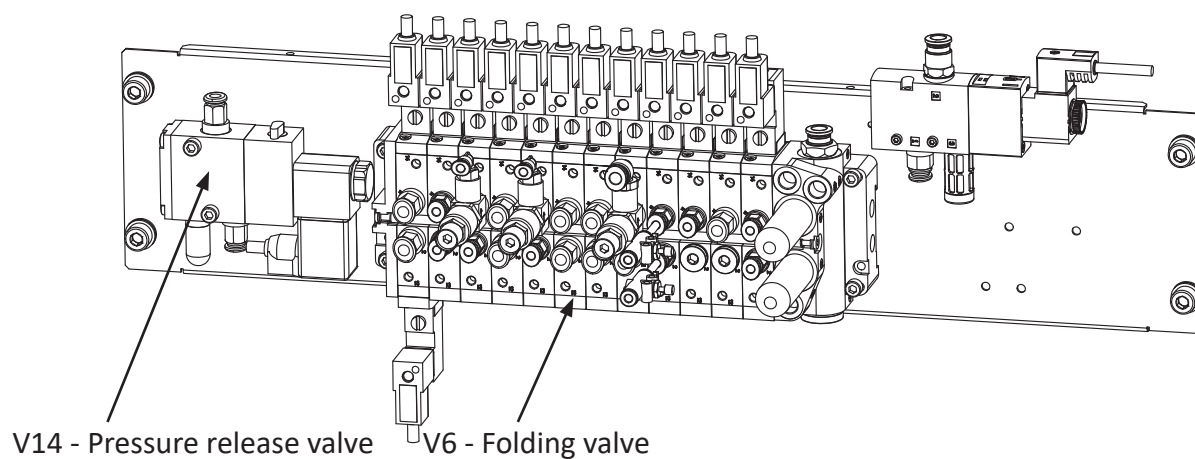
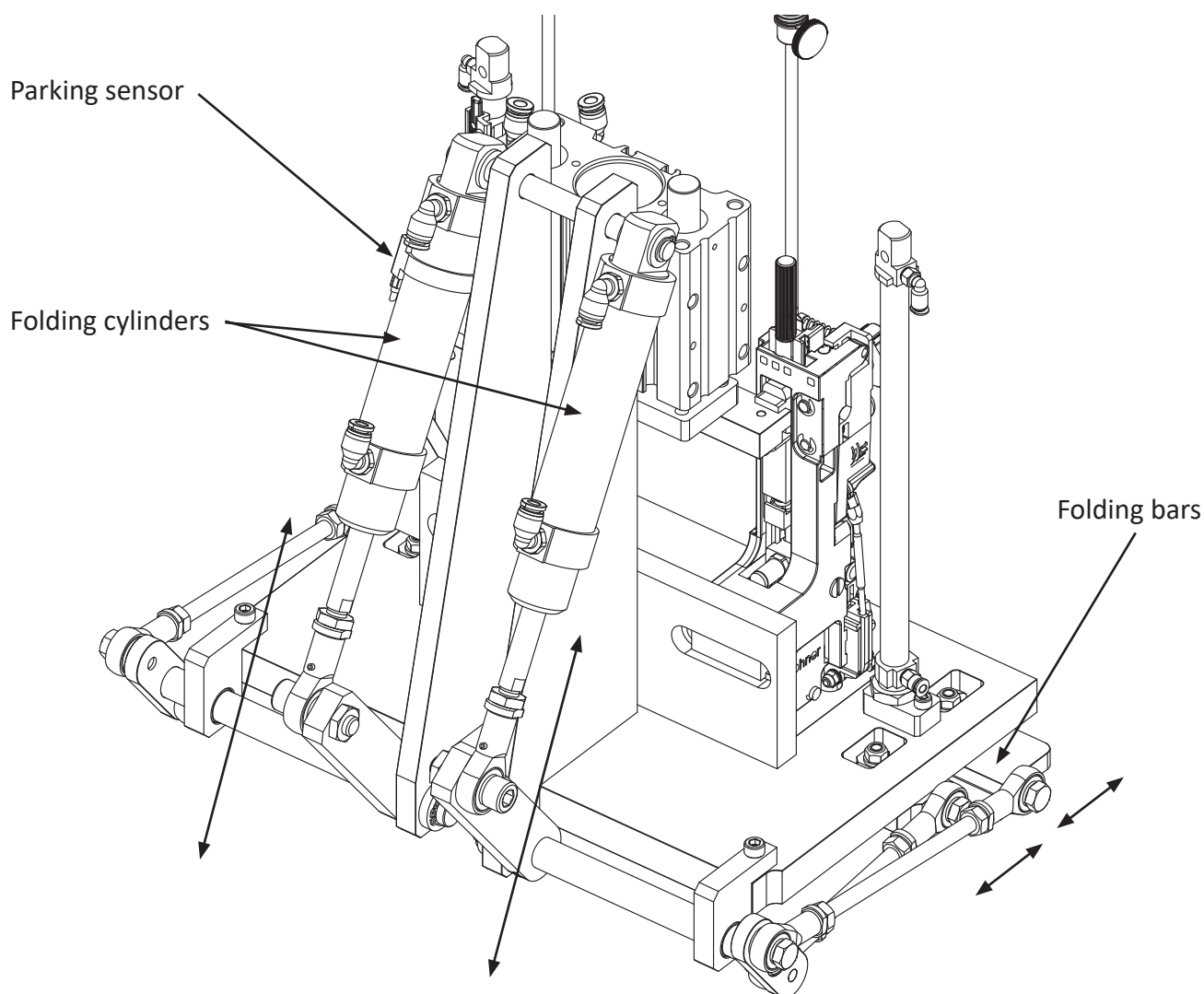
## 8.8 Staple anvil

The Staple anvil will move up under the stack of sheets and lift the stack up to the staplers. The staple anvil will also crimp the staples in the middle of the book.



## 8.9 Folding

After the stack of paper is lifted up to the staplers and stapled, the folding starts. The stack is folded over the staple anvil. Then the anvil is pulled out and the folding is done one more time.

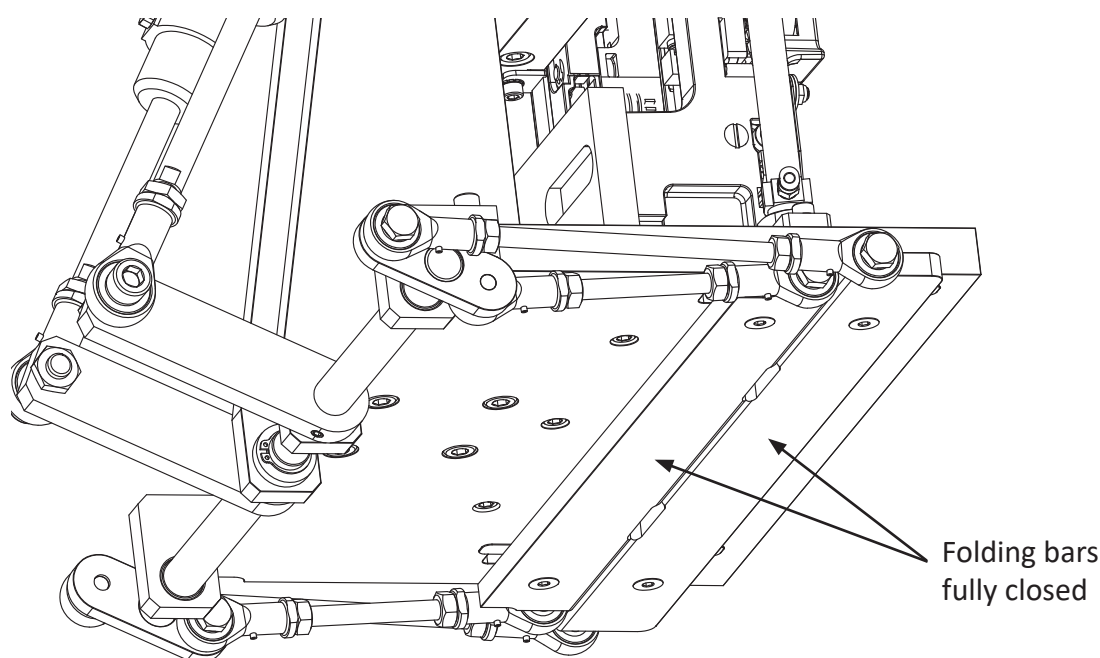
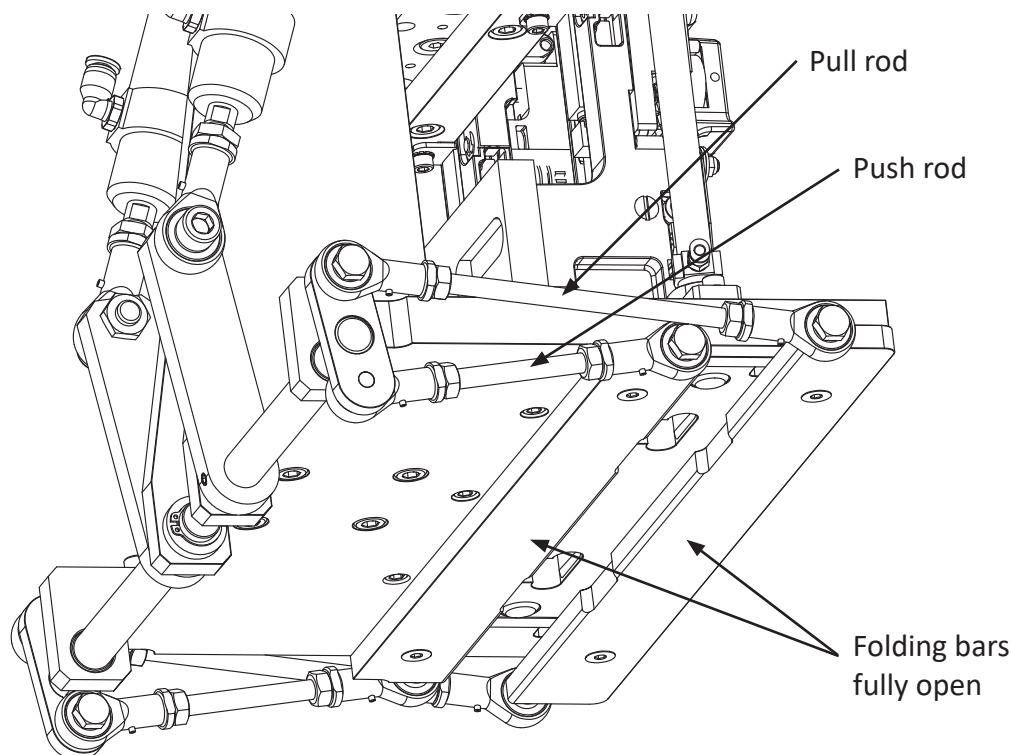


## 8.10 Folding - Adjusting the staple position

If the staples does not seem to be in the exact centre of the book spine, it can be adjusted with the pull and push rods on the Folding unit. Note that the Folding unit's viewed from the underside.

Adjust the length of the push and pull rods so that the center in the gap is positioned exactly under the staplers.

The length of the rods are adjusted by loosen the lock nuts on each side and then turn the rod around with a pair of pliers. Then tighten the lock nuts again. Do this on both rods on both sides of the Folding unit, four rods in total.

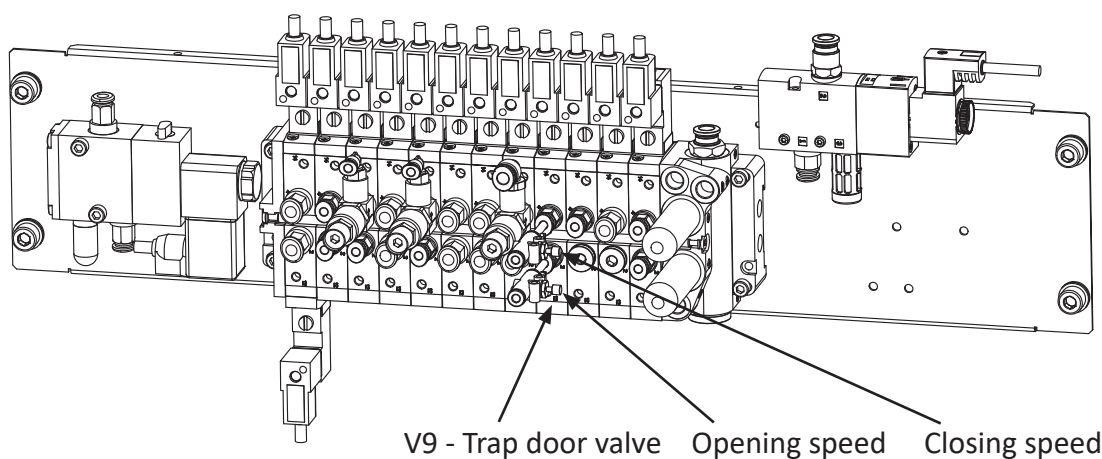
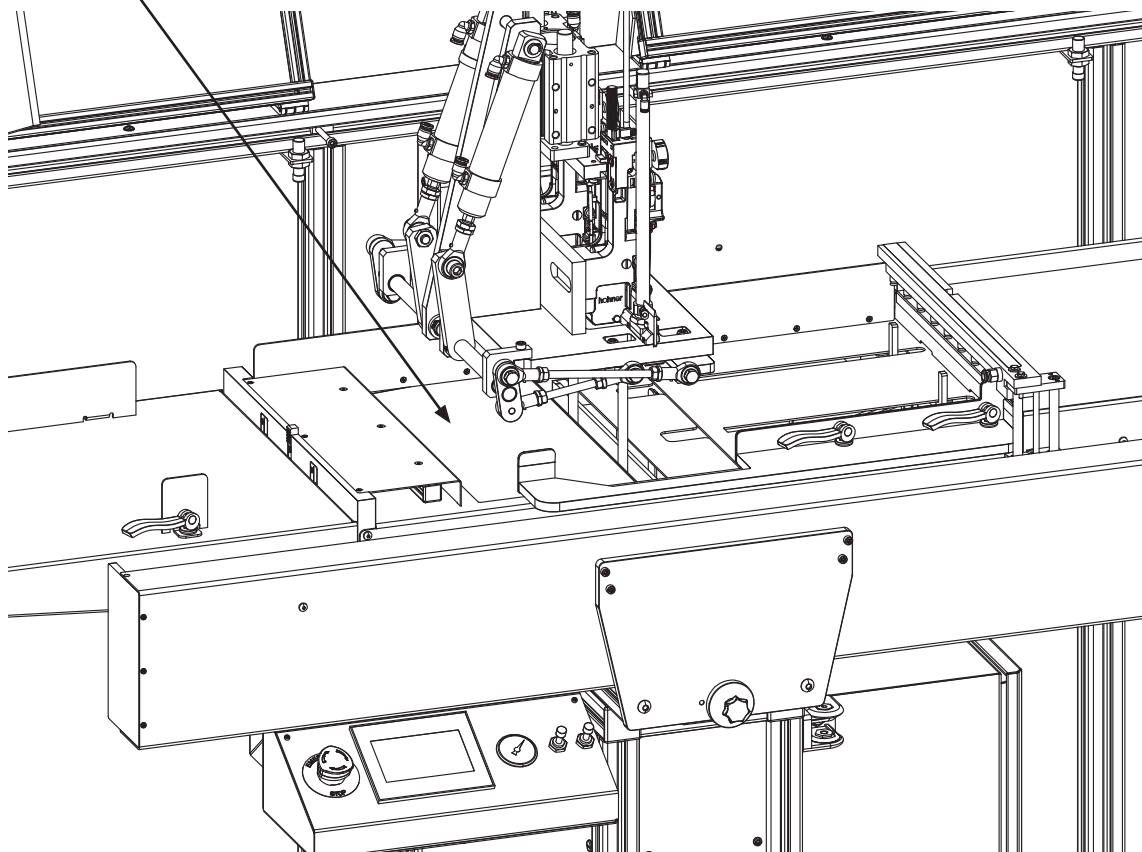


## 8.11 Trap door

Opens when a book is stapled and folded. The book will be ejected and slide down through the opening.

Note! The SF2 Unit's shown without the protecting cover for clarity.

Trap door

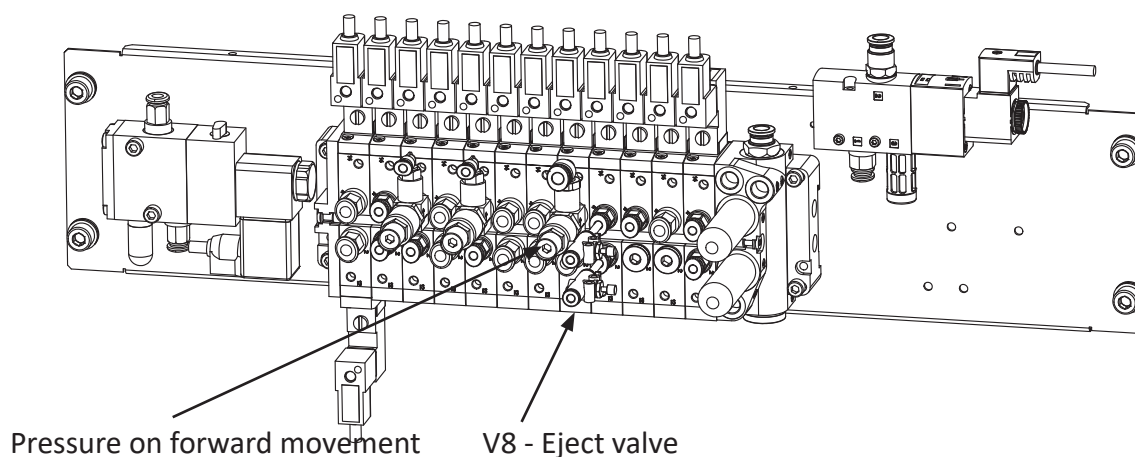
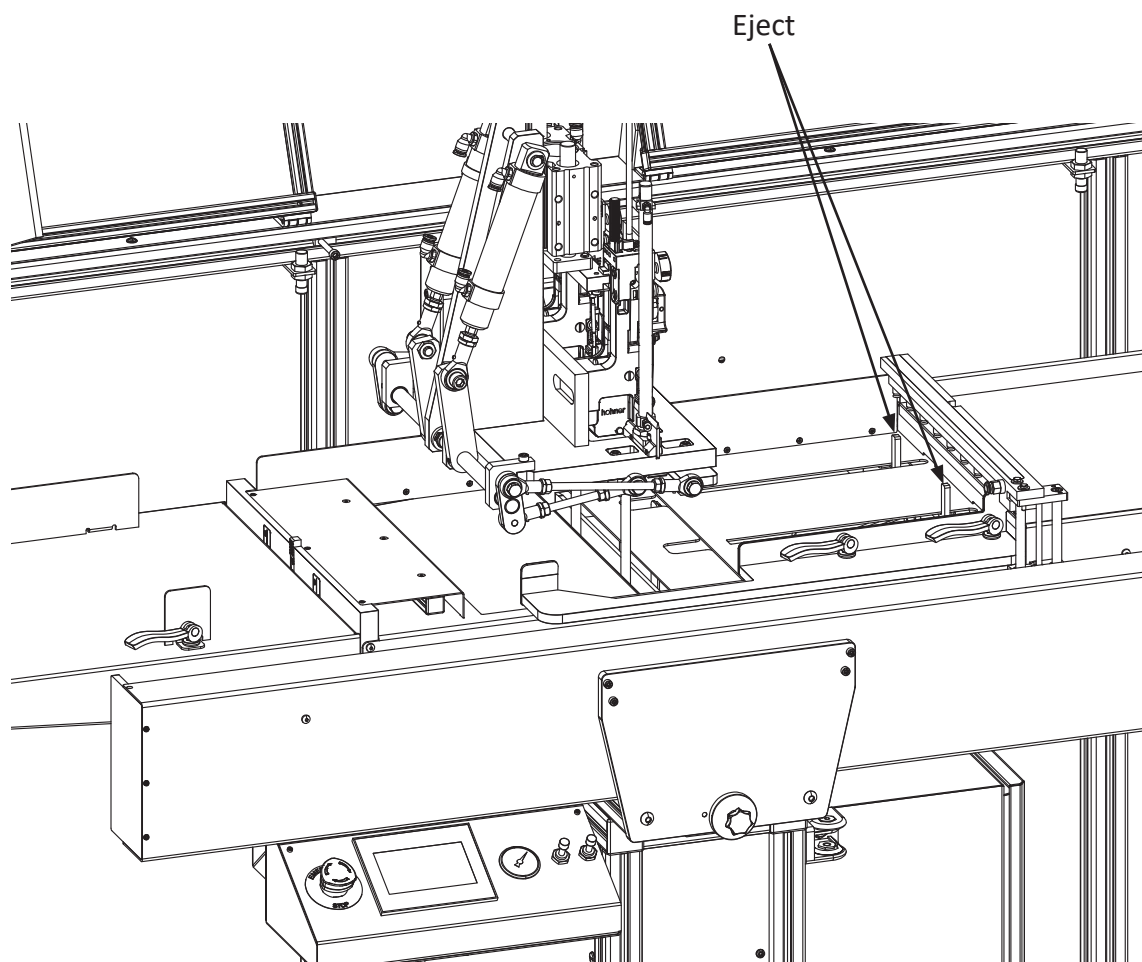


V9 - Trap door valve    Opening speed    Closing speed

## 8.12 Eject

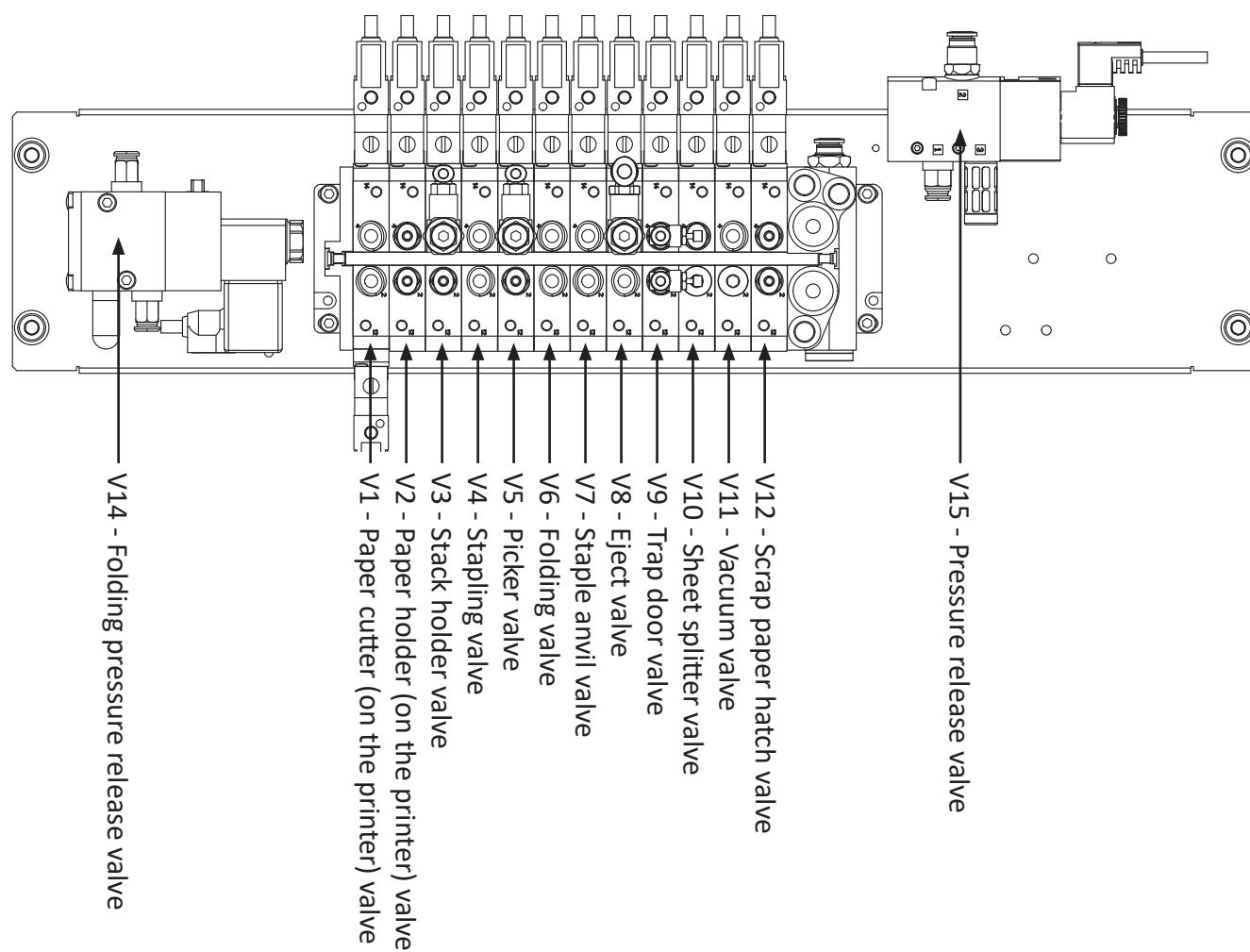
When the book is stapled and folded, the trap door has opened, this paper guide will move forward and eject the book through the trap door opening. A sensor is placed in front of the guides to stop the movement.

Note! The SF2 Unit's shown without the protecting cover for clarity.

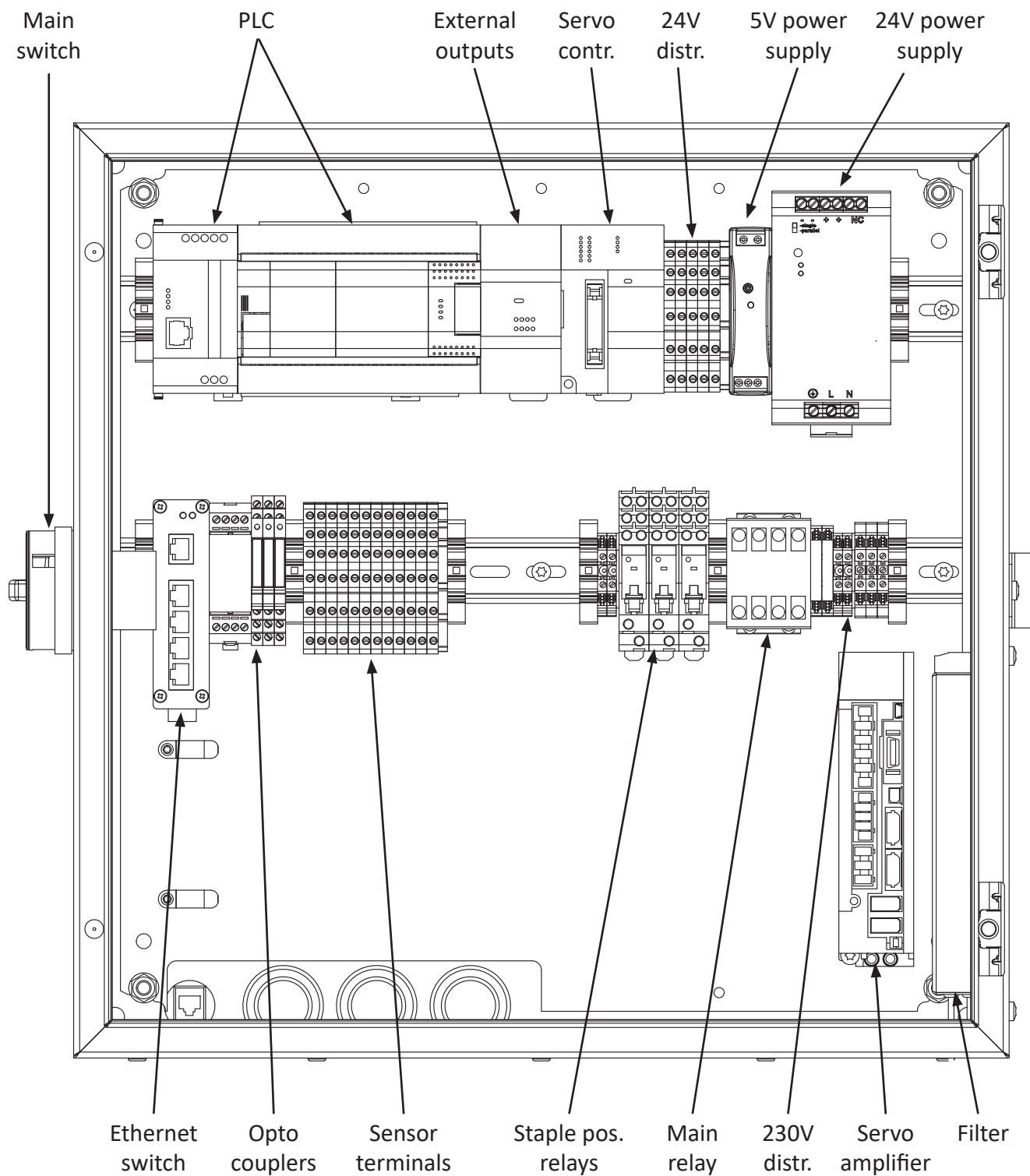


## 8.13 Pneumatic valves

The pneumatic functions on the different valves.



## 8.14 Components inside the control unit





## 8.15 Reference position on the vacuum arm

The arm that moves the paper or cover on the SF2 Unit must have a reference position to be able to position itself correctly when picking up or laying down paper.

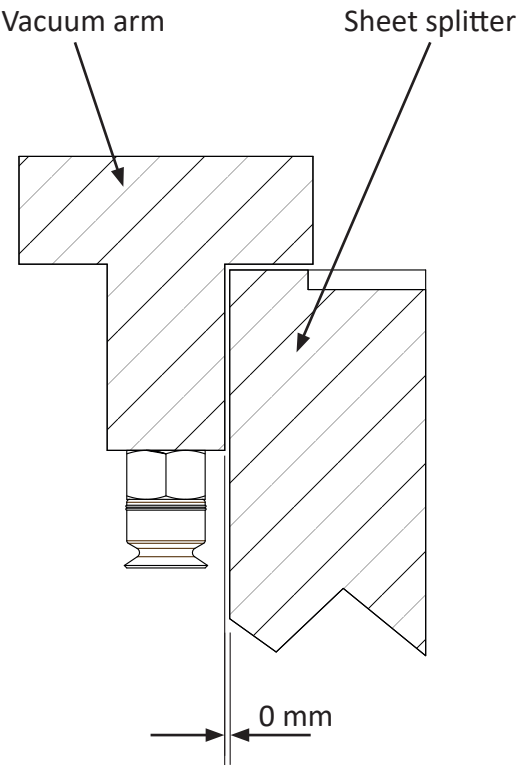
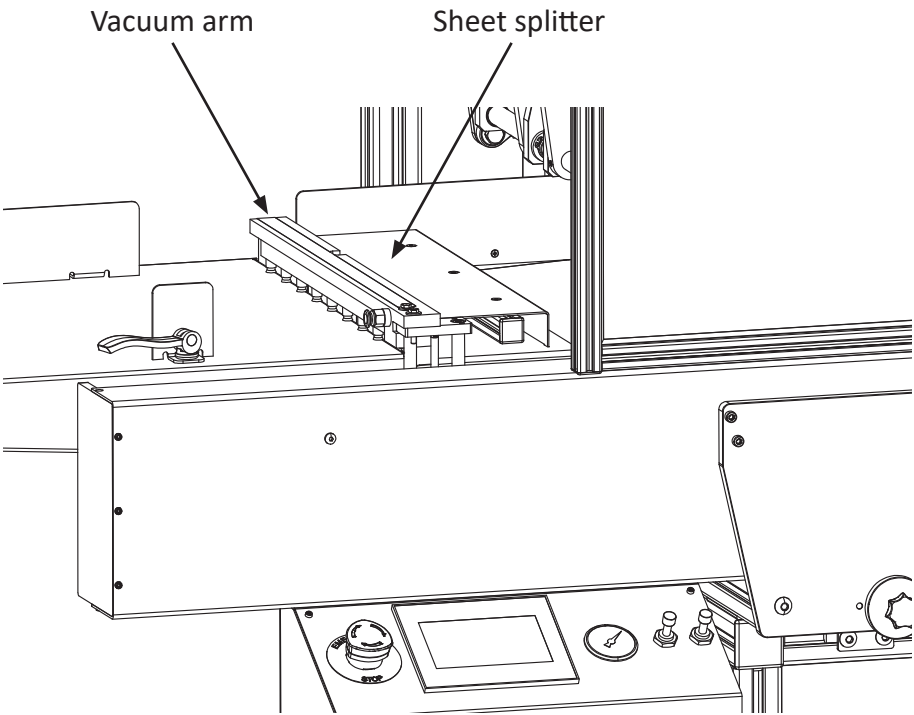
If for some reason the arm has lost its reference position, or needs adjustment, follow the procedure below.

Note! This procedure requires log-in on the SF2 Unit operating panel! See section [“5.2 SF2 Unit - Set-up menu” on page 75](#) for log in information.

1. Turn the SF2 Unit off by setting the printer in sleep mode.
2. Move the vacuum arm by hand to the reference position as shown in the figure below.
3. Wake up the printer again, and enter the servo menu on the SF2 Unit operating panel.  
(Main menu - Setup - Servo).
4. Tap the button 'Be careful! - Start Home'.
5. See that the Sheet Mover value changes to 0.
6. Go back to the Home screen by tapping the 'Prev' button, then the 'Home' button on the Setup menu.

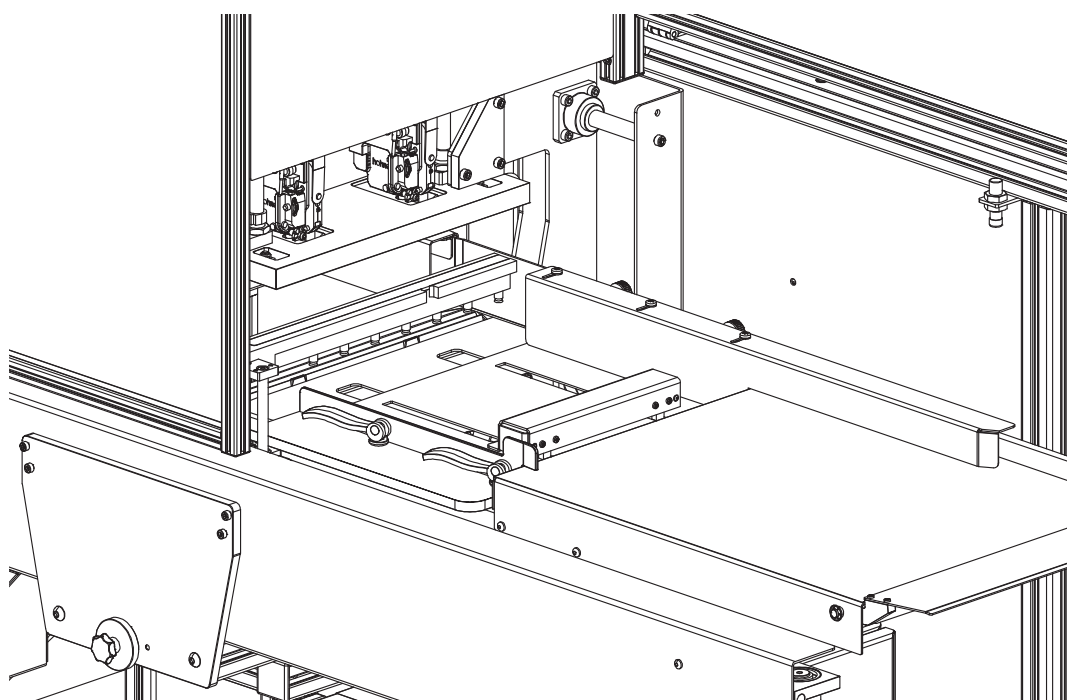
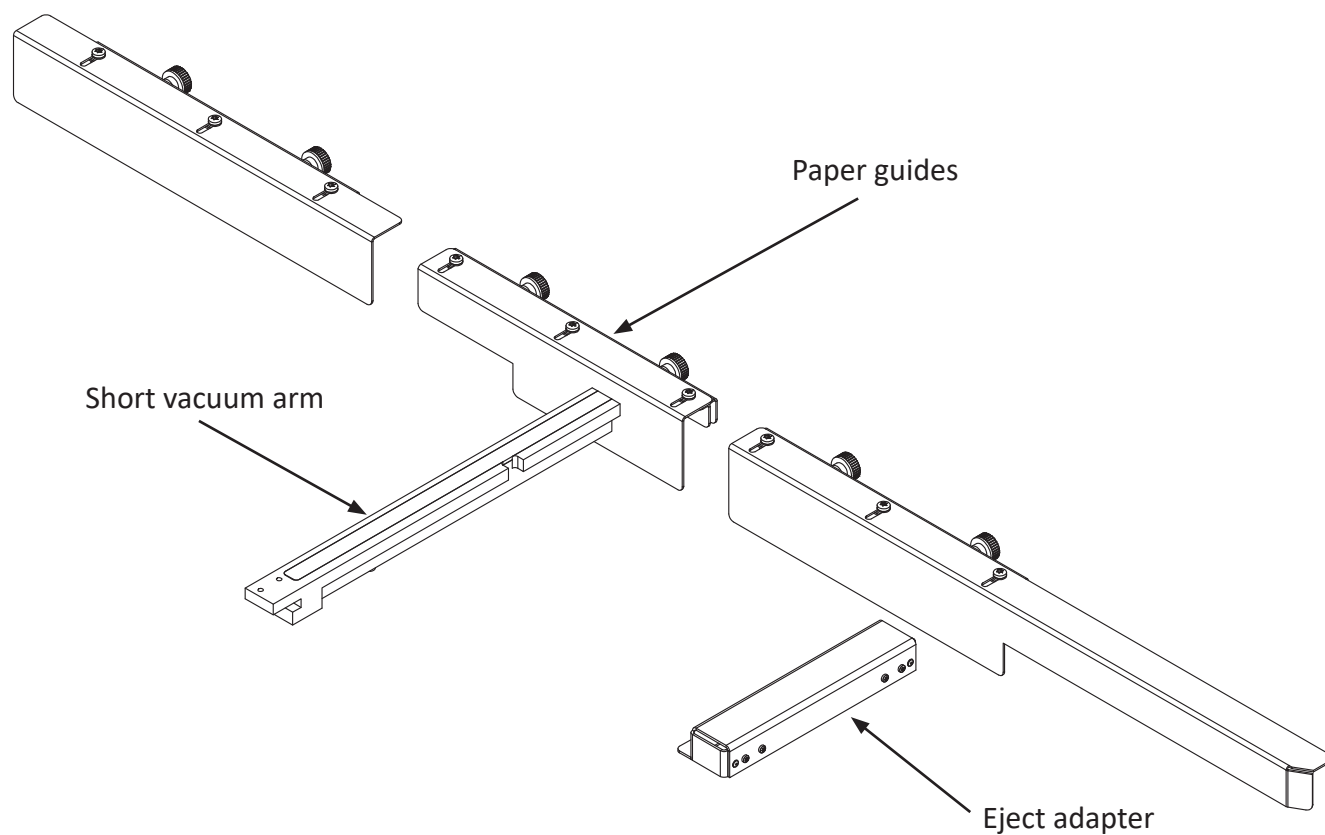






## 8.16 Adapters for smaller sheets

If you want to use smaller sheets on the B650 SF2, it can be a problem to get the stack of sheets aligned with the staple and fold mechanism. Therefore, a set of adjustable guides and a shorter vacuum arm is enclosed with the SF2 Unit.



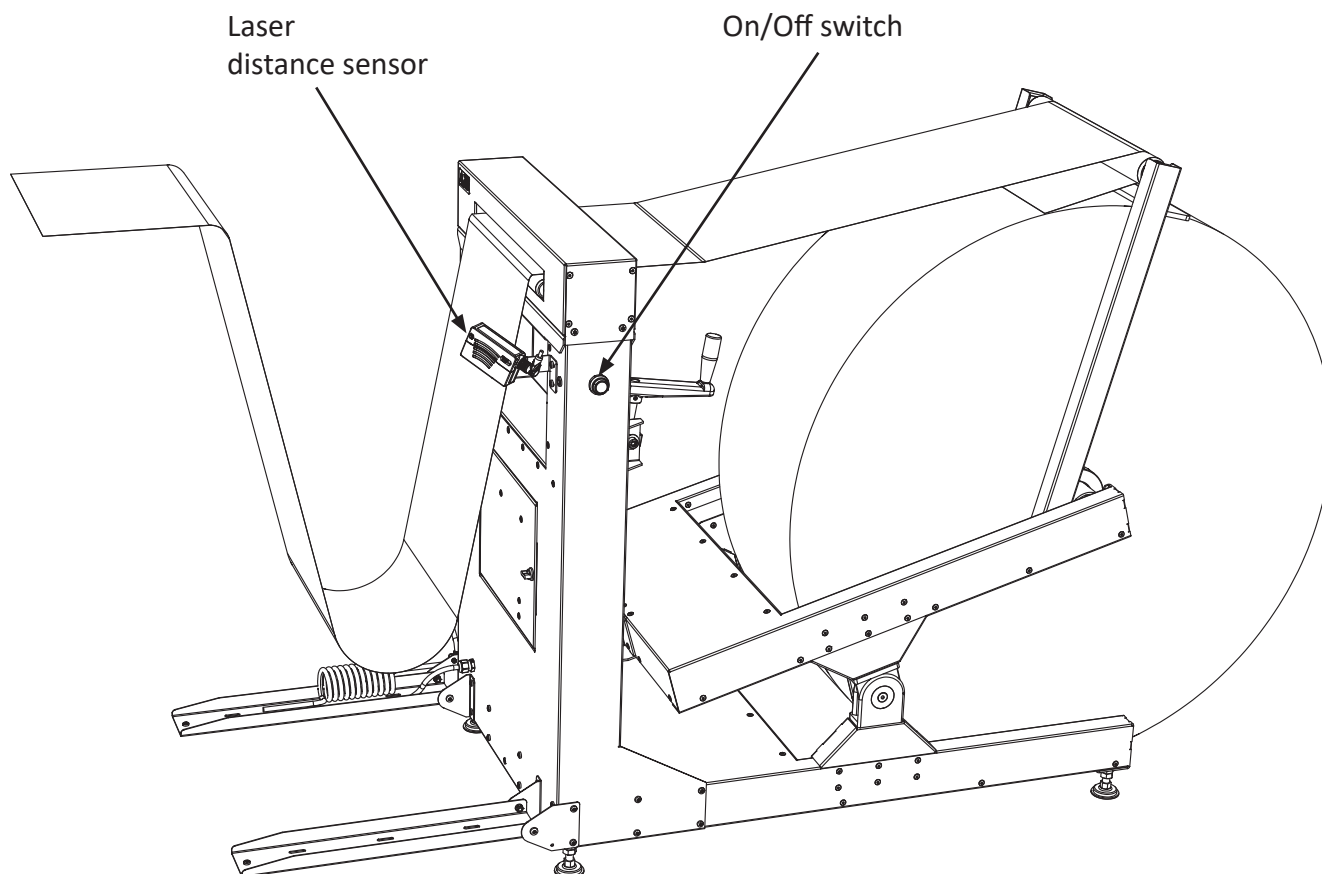
The guides mounted on the SF2 Unit

## 9. ROLL UNWINDER

### 9.1 Description of functions

The Roll Unwinder's main function is to automatically supply the printer with the correct amount of paper. This is done using a laser distance sensor that senses the distance down to the paper. If the distance is getting shorter, the RU will feed paper faster, and if the distance is getting longer it will feed slower. If the printer stops, the paper will also stop completely.

The feeding is done by leading the paper in between two rolls, where one has a built-in motor. The other roll is pressing against the motor roll by a pneumatic cylinder. When the paper feeding stops, the pressure on the pneumatic cylinder is released.



## 10. TECHNICAL SPECIFICATIONS

### 10.1 Technical specifications

#### Format

Paper roll:	Max. diameter 1100 mm (43 inches) Inner core diameter min. 70 mm (2.75 inches), max. 84 mm (3.3 inches)
Paper (roll) width:	Min. 260 mm (10.2 inches), max. 330 mm (13 inches)
Sheet width:	Min. 417 mm (16.4 inches), max. 585 mm (23 inches)
Line length:	Min. 10, max. 44 characters
Printing Mode:	Single/Inter point
Margins:	Inner/Outer min. 12.7, max. 50.8 mm (0.5 - 2 inches)
Page height:	Max. 30 lines per page
Braille cell:	Standard medium 6 dot
Line spacing:	Fixed 5 mm
Paper Weight:	Min. 120 - max. 180 g/m <sup>2</sup> , Recommended 150 g/m <sup>2</sup>

#### Printing Speed

Characters/sec.:	Up to 650 char/sec.
Pages/hour:	No. of pages per hour is dependent on page format

#### Electrical

Voltage:	Single phase 230 V (+/- 10 %), 50/60 Hz
Current:	Approx. 4.4 A max.
Power:	Approx. 1030 W max.
Fuse in printer:	10 AT
Leakage current:	4.75 mA

#### Compressed air

Clean air without oil or water,  
min. 7.0 bar @ 100 l/min., max. temperature 50° C.

#### Communication with the computer

USB  
Ethernet  
WLAN

#### Environment

Temperatures:	15° - 30° C (60° - 86° F)
Rel. Humidity:	40 - 60 %

#### Measurements

Height:	2224 mm
Width:	990 mm
Length:	4596 mm
Weight:	468 kilos

## 10.2 Escape-sequences

What is an escape-sequence?

An escape-sequence is the name for a code which is sent to the printer from the computer to change the parameters which control the way the printer works. All parameters that can be set via the operating panel, can also be changed with escape-sequences.

This makes it possible to have different codes (read; escape-sequences) stored in a document. So, when the document is sent to the printer, these codes are sent first and the printer sets itself in the correct mode and format automatically.



Note! When the printer receives an escape-sequence, it will have first priority. This means, regardless of the setting made before and regardless what the operating panel dictates, the most recent escape-sequence will take precedence.



Note! Escape-sequences should be placed at the very beginning of the first page on the sheet, (e.g. page 1, 3, 5, 7 ...). However, a software form feed can be placed wherever needed. (If there is a command on the other pages, it will be skipped).

All page formatting which is done on the front page will also format the back of the same sheet.

An overview of the different escape-sequences:

ESC B nn	- Line length	nn can be from 10 to 44 characters.
ESC D nn	- Margin 1	nn can be from 0.5" to 2.0"
ESC E nn	- Margin 2	nn can be from 0.5" to 2.0"
ESC G n	- Page 1 up or down	n can be 0 (Page 1 up) or 1 (Page 1 down).
ESC H n	- Print format	n can be 0 (Single sided) or 1 (Inter point).
ESC P nn	- No. of sheets	nn can be from 01 to 99 sheets
ESC 0	- Soft Reset	
ESC 1	- Soft Form Feed	
ESC 4	- Adding the printer ID at the last line on the sheet	



**Note!** The escape-sequences will be executed immediately if the printer is not running. However, if the printer is running, the escape-sequences will keep their place in the document, and will be executed when this particular page is printed. Also keep in mind that any page formatting command must be kept on the front page of a sheet. Then the command will affect both the front and back page, i.e. one sheet. If there are page formatting commands on the back page of a sheet, these commands will be skipped.

Please see the following explanations on how to combine different values to get the different escape-sequences.

### Line length

ESC B nn - Line length.  
nn can be from 10 to 44 characters.

Char	ASCII	HEX
10	027 066 049 048	1B 42 31 30
11	027 066 049 049	1B 42 31 31
12	027 066 049 050	1B 42 31 32
13	027 066 049 051	1B 42 31 33
14	027 066 049 052	1B 42 31 34
15	027 066 049 053	1B 42 31 35
16	027 066 049 054	1B 42 31 36
17	027 066 049 055	1B 42 31 37
18	027 066 049 056	1B 42 31 38
19	027 066 049 057	1B 42 31 39
20	027 066 050 048	1B 42 32 30
21	027 066 050 049	1B 42 32 31
22	027 066 050 050	1B 42 32 32
23	027 066 050 051	1B 42 32 33
24	027 066 050 052	1B 42 32 34
25	027 066 050 053	1B 42 32 35
26	027 066 050 054	1B 42 32 36
27	027 066 050 055	1B 42 32 37
28	027 066 050 056	1B 42 32 38
29	027 066 050 057	1B 42 32 39
30	027 066 051 048	1B 42 33 30
31	027 066 051 049	1B 42 33 31
32	027 066 051 050	1B 42 33 32
33	027 066 051 051	1B 42 33 33
34	027 066 051 052	1B 42 33 34
35	027 066 051 053	1B 42 33 35
36	027 066 051 054	1B 42 33 36
37	027 066 051 055	1B 42 33 37
38	027 066 051 056	1B 42 33 38
39	027 066 051 057	1B 42 33 39
40	027 066 052 048	1B 42 34 30
41	027 066 052 049	1B 42 34 31
42	027 066 052 050	1B 42 34 32
43	027 066 052 051	1B 42 34 33
44	027 066 052 052	1B 42 34 34

Default is 42 characters per. line.

### Margin 1

ESC D nn - Margin 1.  
nn can be from 0.5" to 2.0"

Margin 1	ASCII	HEX
0.5"	027 068 048 053	1B 44 30 35
0.6"	027 068 048 054	1B 44 30 36
0.7"	027 068 048 055	1B 44 30 37
0.8"	027 068 048 056	1B 44 30 38
0.9"	027 068 048 057	1B 44 30 39
1.0"	027 068 049 048	1B 44 31 30
1.1"	027 068 049 049	1B 44 31 31
1.2"	027 068 049 050	1B 44 31 32
1.3"	027 068 049 051	1B 44 31 33
1.4"	027 068 049 052	1B 44 31 34
1.5"	027 068 049 053	1B 44 31 35
1.6"	027 068 049 054	1B 44 31 36
1.7"	027 068 049 055	1B 44 31 37
1.8"	027 068 049 056	1B 44 31 38
1.9"	027 068 049 057	1B 44 31 39
2.0"	027 068 050 048	1B 44 32 30

Default is 1.0".

**Margin 2**

ESC E nn - Margin 2.  
nn can be from 0.5" to 2.0"

Margin 1	ASCII	HEX
0.5"	027 069 048 053	1B 45 30 35
0.6"	027 069 048 054	1B 45 30 36
0.7"	027 069 048 055	1B 45 30 37
0.8"	027 069 048 056	1B 45 30 38
0.9"	027 069 048 057	1B 45 30 39
1.0"	027 069 049 048	1B 45 31 30
1.1"	027 069 049 049	1B 45 31 31
1.2"	027 069 049 050	1B 45 31 32
1.3"	027 069 049 051	1B 45 31 33
1.4"	027 069 049 052	1B 45 31 34
1.5"	027 069 049 053	1B 45 31 35
1.6"	027 069 049 054	1B 45 31 36
1.7"	027 069 049 055	1B 45 31 37
1.8"	027 069 049 056	1B 45 31 38
1.9"	027 069 049 057	1B 45 31 39
2.0"	027 069 050 048	1B 45 32 30

Default is 1.0".

**Number of sheets**

ESC P nn - Number of sheets  
nn can be 01 to 99 sheets.

Sheets	ASCII	HEX
01	027 080 048 049	1B 50 30 31
02	027 080 048 050	1B 50 30 32
03	027 080 048 051	1B 50 30 33
04	027 080 048 052	1B 50 30 34
05	027 080 048 053	1B 50 30 35
06	027 080 048 054	1B 50 30 36
07	027 080 048 055	1B 50 30 37
08	027 080 048 056	1B 50 30 38
09	027 080 048 057	1B 50 30 39
10	027 080 049 048	1B 50 31 30
11	027 080 049 049	1B 50 31 31
12	027 080 049 050	1B 50 31 32
13	027 080 049 051	1B 50 31 33
14	027 080 049 052	1B 50 31 34
15	027 080 049 053	1B 50 31 35
16	027 080 049 054	1B 50 31 36
17	027 080 049 055	1B 50 31 37
18	027 080 049 056	1B 50 31 38
19	027 080 049 057	1B 50 31 39
20	027 080 050 048	1B 50 32 30

**Page 1 up or down**

ESC G n - Page 1 up/down.  
n can be 0 (up) or 1 (down).

Page 1	ASCII	HEX
Up	027 071 048	1B 47 30
Down	027 071 049	1B 47 31

Default is Page 1 Up.

**Print Format**

ESC H n - Print Format.  
n can be 0 (single-sided) or 1 (interpoint).

Print Format	ASCII	HEX
Single-sided	027 072 048	1B 48 30
Double-sided	027 072 049	1B 48 31

Default is Double-sided.

**Software Reset**

ESC 0            - Soft Reset.

This command is used to reset the printer. It's used from the computer and has the same effect as pushing the key RESET PRINTER. Software Reset should be used with care: If the printer has not finished printing, the rest of the text in the buffer will be lost, and a new paper position will be assumed by the printer. Because of this, the command is only to be used after a software form feed has been executed, and the printer has stopped completely.

	ASCII	HEX
Software Reset	027 048	1B 30

**Software Form Feed**

ESC 1            - Soft Form Feed.

This command is to be used after all text in one volume has been transmitted to the printer. If text corresponding to less than two pages, or text with an odd number of pages is received, and not followed by FF on the last page, the printer will wait for more text or FF. This means that the last page may be stuck in the printer. This is due to the double-sided printing of the printer. This command makes the printer to start printing the rest of the text. After this the paper position will be the same as it had when this volume of text was started. Then page no. 1 on the next volume will start out correctly. There will always be at least one blank sheet of paper between the volumes of text when finishing each volume with a Software Form Feed.

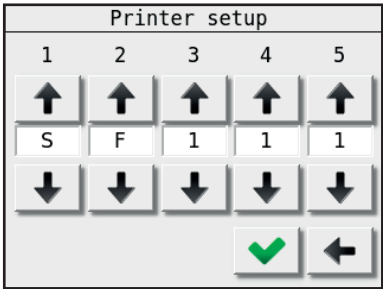
	ASCII	HEX
Software Form Feed	027 049	1B 31

**Print Printer ID**

ESC 4            - Adding the printer ID.

When you have several braille printers producing the same braille material, it's not always easy to later figure out what printer made which book. It's therefore possible to add a printer ID to the last line on a sheet. There is no matter where the escape-sequence is placed on the page, the ID will always be printed on the last line. Meaning, if you send this escape-sequence on the last page of every print job, you will get the printer ID printed on the last line on the last page.

The printer ID is a 5 digit code that has to be set in the menu choice: *Main menu - Printer Setup - Printer ID*. See figure below.





### 10.3 Warranty

This product left the factory in a good working condition in accordance with the technical specifications and carries a warranty of 3 years on parts valid from the date of delivery from Braillo Norway AS.

Braillo will offer an additional 1 year to the standard warranty by using Braillo/American Thermoform (ATC) braille paper with your printer. The use of poor quality braille paper often causes excessive wear and tear on a printer, which causes parts to fail prematurely. Using Braillo/ATC's specially formulated braille paper will help ensure these risks are minimized.

This brings the total warranty to 4 years, or up to 10,700 hours. This amounts to up to 20.8 million braille pages.

The warranty includes:

- Replacement of defect part(s)
- Shipping cost for the replaced part(s)

The warranty excludes:

- On-site part replacement (labour, travelling and living expenses for a service engineer)
- Shipping costs for sending the faulty unit back to Braillo Norway AS (see below).
- Altered product (except as authorized by Braillo Norway AS) or product not installed or maintained in accordance with Braillo Norway's instructions.
- Customs and duties.
- Incidents involving Force Major (for example flooding, earth quake etc. damaging the product).

Should a replacement part be required, please send an email to [service@braillo.com](mailto:service@braillo.com) with the following information:

- What part is defect? Add picture(s) to describe the part if you are not sure on the correct part number or name.
- What is the problem? Describe so detailed and accurate as possible.
- The printer model and serial number.
- The hour and sheet counter.
- Contact person with email and phone number.

When Braillo receives your email, we will get back to you and the parts will be shipped as soon as possible.

What to do with the defective part(s):

If a communication has been made to our service department, and an approval has been given, it will not be necessary to return the part(s) to Braillo Norway AS. In all other cases, the part(s) must be returned to Braillo Norway AS as soon as possible. If the part(s) has/have not been received by Braillo Norway AS within 2 months from the date the parts arrived on site, this is no longer regarded as a warranty matter and an invoice will be issued and sent.

## 10.4 Legal notices

### Liability disclaimer

Braillo Norway AS reserves the right to make changes without further notice to the product to improve reliability, function or design. Braillo Norway AS does not assume any liability arising out of use of the product described herein.

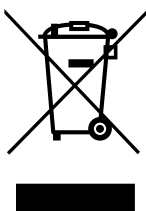
All information contained in this document represents information on the product at the time of publication. Braillo Norway AS reserves the right to make corrections, enhancements and other changes to this document without notice. While Braillo Norway AS has used reasonable care in preparing the information included in this document, it may contain technical or other inaccuracies, omissions and typographical errors. Please contact us should you find something that you feel needs correction or explanation.

### RoHS and REACH statement

Braillo Norway AS products meet the requirements of Directive 2011/65/EU of the European Parliament and of the Council on the Restriction of Hazardous Substances (RoHS 2) and the requirements of the REACH regulation (EC 1907/2006) on Registration, Evaluation, Authorization and Restriction of Chemicals.

### WEEE

This product must not be disposed of with normal household waste, but rather disposed by returning it to a designated collection point for recycling of waste from electrical and electronic equipment.



### Copyright notice

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10.5 Declaration of conformity Printer

EU Declaration of Conformity

This Declaration of Conformity is issued under the sole responsibility of the manufacturer.

Manufacturer: Braillo Norway AS  
Address: Wessels veg 100  
7502 Stjørdal  
Norway

Applicable Directive(s):

2014/30/EU	EMC Directive
(EU)2023/1230	Machinery Directive
2014/35/EU	LV Directive
2011/65/EU	RoHS Directive

Object of the Declaration:

Product: Braille printer B650  
Model Number: SF2.1  
Serial Numbers: 801154

Applied Standards:

Reference and Date	Title of Standard
BS EN 61000-6-4:2019	Electromagnetic compatibility (EMC) – Generic Emissions standard for industrial environments
BS EN 61000-6-2:2019	Electromagnetic compatibility (EMC) – Generic Immunity standard for industrial environments.
BS EN 55035:2017+A11:2020	Electromagnetic compatibility (EMC) – of multimedia equipment – Immunity requirements.
BS EN 55032:2015+A1:2020	Electromagnetic compatibility (EMC) – of multimedia equipment – Emission requirements.
BS EN 62368-1:2020	Audio / video, information and communication technology equipment.

I hereby declare that the object of the declaration complies with all of the applicable Essential Requirements of the Directive(s).

Signed for and on behalf of: Braillo Norway AS  
Name: Patrick N. Nunnelly  
Position: Managing director  
Place of Issue: Wessels veg 100, 7502 Stjørdal, Norway  
Date of Issue: 17/01/2024

Signature: 

## 10.6 Declaration of conformity Roll Unwinder

### EU Declaration of Conformity

This Declaration of Conformity is issued under the sole responsibility of the manufacturer.

Manufacturer: Braillo Norway AS

Address: Wessels veg 100  
7502 Stjørdal  
Norway

#### Applicable Directive(s):

2014/30/EU	EMC Directive
(EU)2023/1230	Machinery Directive
2014/35/EU	LV Directive
2011/65/EU	RoHS Directive

#### Object of the Declaration:

Product: Roll Unwinder

Model Number: -

Serial Numbers: 601274

#### Applied Standards:

Reference and Date	Title of Standard
BS EN 61000-6-4:2019	Electromagnetic compatibility (EMC) – Generic Emissions standard for industrial environments
BS EN 61000-6-2:2019	Electromagnetic compatibility (EMC) – Generic Immunity standard for industrial environments.
BS EN 55035:2017+A11:2020	Electromagnetic compatibility (EMC) – of multimedia equipment – Immunity requirements.
BS EN 55032:2015+A1:2020	Electromagnetic compatibility (EMC) – of multimedia equipment – Emission requirements.
BS EN 62368-1:2020	Audio / video, information and communication technology equipment.

I hereby declare that the object of the declaration complies with all of the applicable Essential Requirements of the Directive(s).

Signed for and on behalf of: Braillo Norway AS

Name: Patrick N. Nunnelly

Position: Managing director

Place of Issue: Wessels veg 100, 7502 Stjørdal, Norway

Date of Issue: 17/01/2024

Signature: \_\_\_\_\_



10.7 Declaration of conformity SF Unit

EU Declaration of Conformity

This Declaration of Conformity is issued under the sole responsibility of the manufacturer.

Manufacturer: Braillo Norway AS  
Address: Wessels veg 100  
7502 Stjørdal  
Norway

Applicable Directive(s):

2014/30/EU	EMC Directive
(EU)2023/1230	Machinery Directive
2014/35/EU	LV Directive
2011/65/EU	RoHS Directive

Object of the Declaration:

Product: SF2 Unit  
Model Number: -  
Serial Numbers: 560056

Applied Standards:

Reference and Date	Title of Standard
BS EN 61000-6-4:2019	Electromagnetic compatibility (EMC) – Generic Emissions standard for industrial environments
BS EN 61000-6-2:2019	Electromagnetic compatibility (EMC) – Generic Immunity standard for industrial environments.
BS EN 55035:2017+A11:2020	Electromagnetic compatibility (EMC) – of multimedia equipment – Immunity requirements.
BS EN 55032:2015+A1:2020	Electromagnetic compatibility (EMC) – of multimedia equipment – Emission requirements.
BS EN 62368-1:2020	Audio / video, information and communication technology equipment.

I hereby declare that the object of the declaration complies with all of the applicable Essential Requirements of the Directive(s).

Signed for and on behalf of: Braillo Norway AS  
Name: Patrick N. Nunnelly  
Position: Managing director  
Place of Issue: Wessels veg 100, 7502 Stjørdal, Norway  
Date of Issue: 17/01/2024

Signature: 



## 10.8 Address and phone number

### Braillo Norway AS

Wessels veg 100  
7502 Stjørdal  
Norway

Phone: +47 74 84 04 40

Email service: [service@braillo.com](mailto:service@braillo.com)

Email sales: [sales@braillo.com](mailto:sales@braillo.com)

Web: [www.braillo.com](http://www.braillo.com)