FELIX printers

Quick Start Guide

FELIX Pro L/XL

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1 Safety

General safety

- Keep children under the age of 14 out of reach of the printer
- FELIXprinters are only suitable for professional use.

Considerations when in operation.

- **Don't leave the printer unattended, before making sure the first layer is printed properly**
- Don't lean on the printer.
- Be careful with long hair and wide clothes.
- Don't transport the printer.
- Make sure all moving parts can move without any obstructions.
- Don't remove any objects from the hot plate while printing.
- Caution with any moving parts that move in the X, Y and Z direction. Moving parts can have a pinching hazard.

Electronic safety

- Only use the power supplies and cables supplied by FELIXprinters. Always turn off and unplug the printer before performing maintenance or modifications.
- The power supply meets all CE mark regulations and is protected against short-circuit, overload, over voltage and over temperature.

Printer placement

- Place the FELIXprinter on a stable surface.
- Place the printer out of reach of children. Use the FELIXprinter in a dry environment at room temperature.

Ventilate

- Good ventilation while printing is advised. When printing ABS, small concentrations of styrene vapor can be released. This can (in some cases) cause headaches, fatigue, dizziness, confusion, drowsiness, malaise, difficulty in concentrating, and a feeling of intoxication.
- We recommend using filament types shown on the FELIXprinters website. Examples PLA, PETG, ABS-X, Glassbend etc. Other types may be toxic; please follow instructions from the filament supplier.

Caution with heater elements

- There is a potential risk of burn, as the print head can reach temperatures of up to 275°C and the heated bed of up to 105°C.
- Don't place objects on the heated bed, not even when the printer is turned off.
- Always let the printer cool down for at least 5 minutes before doing maintenance or modifications.

2 Introduction

Thank you for choosing FELIXprinters!

It is highly recommended to at least read this manual. It explains in short how to make your first print and contains important information to operate the printer properly.

Kind regards,

FELIXprinters

3 Contents

4 Printer specifications

System specifications

- Printer dimensions (L, W, H) 600 x 666 x 776 mm (XL)
- Printer dimensions (L, W, H) 906 x 666 x 966 mm (L)
- Weight 65 kg (L), 80 kg (XL)
- Power requirements: 220 V

Capabilities

- Build volume (L, W, H) 300 x 400 x 400 mm (L)
- Build volume (L, W, H) 600 x 400 x 600 mm
- Layer height range 0.05 - 0.25 mm (L) 0.05 – 0.35 (XL)
- Bed temperature: max. 110 °C
- Flex plate
- Software bed leveling
- Automatic nozzle calibrations

Extruders

- Diameter nozzle: 0.35 mm (L) 0.5 (XL) (optional 0.5 and 0.7mm)
- Nozzle temperature: max. 275 °C
- Full metal hot-ends
- Filament flow detection

Interface

- Capacitive Touchscreen, Raspberry processor
- Print server (Repetier-Server)
- Webcam
- Print file management
- 16GB memory

Print materials

- Open source 1.75 mm filaments
- Tolerance: ± 0.15 mm
- PLA, PET(G), Flex, ABS-X, PVA, Wood, Glass

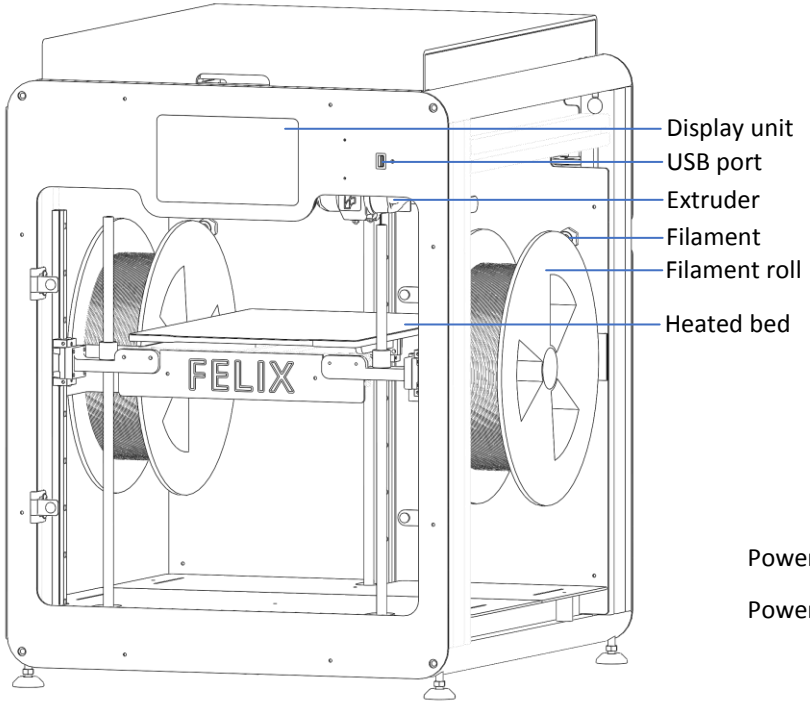
Connectivity

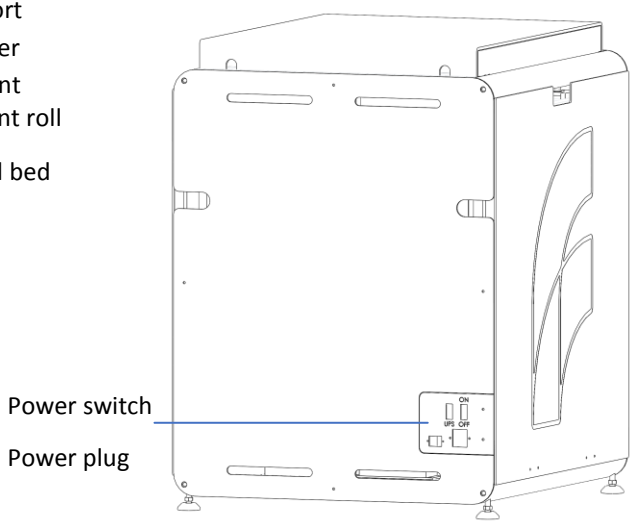
- USB flash drive
- WIFI
- Wired Ethernet

Software

- Simplify3D
- Open source Repetier-Host for FELIXprinters.

5 FELIX Pro L/XL at a glance





6 What's in the box?

A 1x Tweezers

B 1x Power cable

C 1x MicroSD card + USB reader

D 2x Teflon tubes

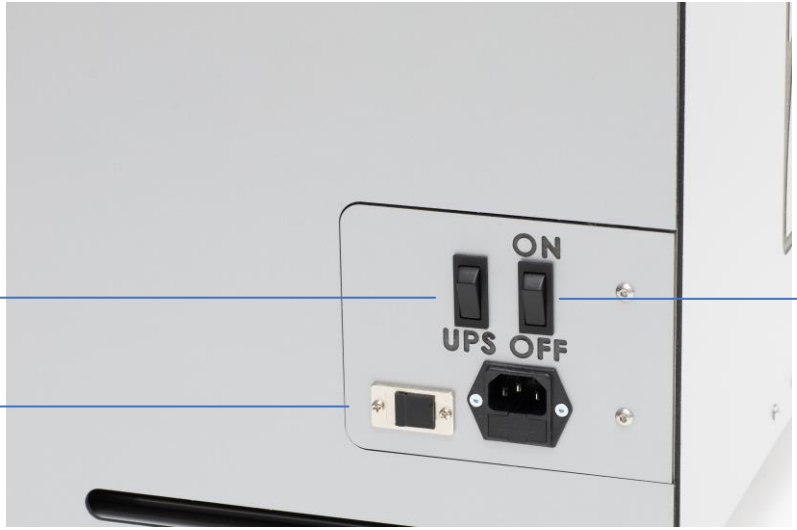
Recommended tools

NB: The box could contain extra materials like filament you have ordered.

6.1 **Installing Teflon tubes**

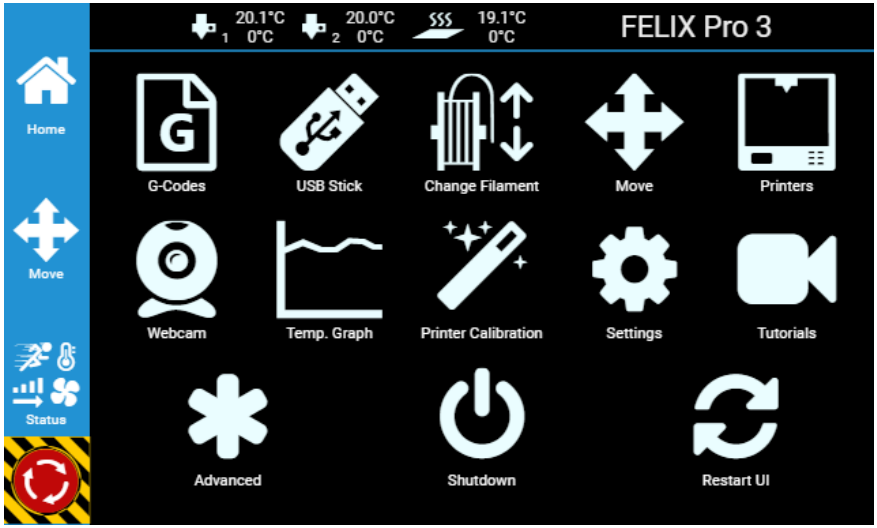
6.2 Power on

1. Insert the power cable.



2. Flip the power switch of the printer (the one on the right), the one on the left is for activating the Power saving system turn that one on as well (batteries will need to be charge before the system is ready, they start to charge when the switch labeled UPS is turned on.
3. The lights of the print-head should turn on and immediately after turning on the printer a FELIX bootscreen should be displayed.
4. Bootup time takes about 40 seconds.

7 Display Overview

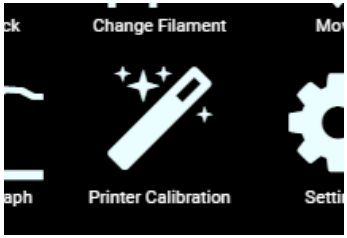


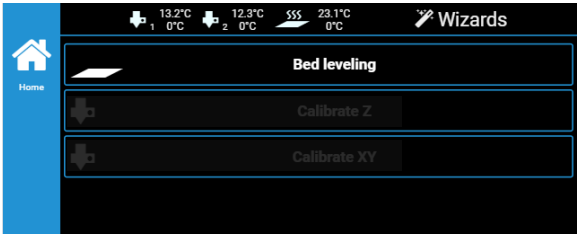
Shutdown button: To properly shutdown the printer. First press the shutdown button before turning the power switch off. This ensures proper shutting down of the operating system on the Display unit.

8 Preparation for printing

8.1 Calibration.

IMPORTANT: Only PERFORM BED LEVELING after unboxing. The printer is already fully factory calibrated.





Bed leveling: This tilts the bed in the software so the distance between nozzle and bed is the same everywhere. When to do this?:

1. After unboxing/moving printer.
2. When you see first layer printed lines are deviating from width across the print surface.

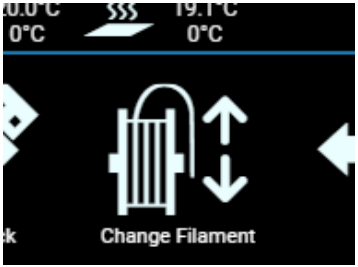
XY and Z Nozzle calibration: These calibrations align the printheads with respect to each other to get an optimal dual head print. When to do this?

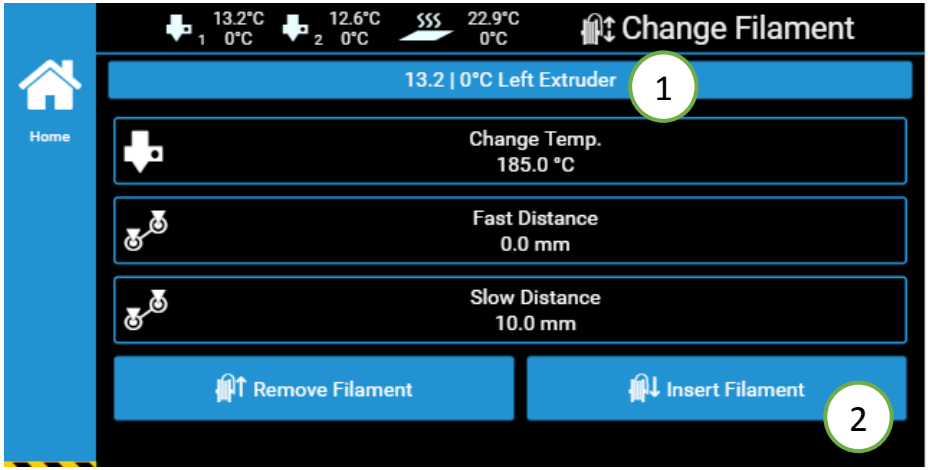
1. After exchanging a hot-end
2. When you clearly see that during dual head printing the nozzles are not aligned in x,y or height.

8.2 Load Filament

Ensure the filament is cut off in a skew manner, so the extruder can easily grip the filament.

Press the change filament button in the home menu.



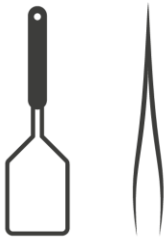


1. **Select the left or right extruder**
2. **Press insert filament.** The print-heads will warm up and can take around 1 minute.
3. **Now continue by pressing insert filament.** While inserting the filament, help the printer by pushing it downwards in the extruder until you feel the printer has gripped the filament.
4. **Continue extruding until filament comes out of the printhead.**

8.3 Clean the print surface

The first layer is the most important layer of a print. It forms the basis for the rest of the print. To ensure the most optimal first layer adhesion do one of the following:

First remove any filament residue from the surface, with a spatula or carefully with the tweezers.



Second use one of the two approaches to further prepare the surface:

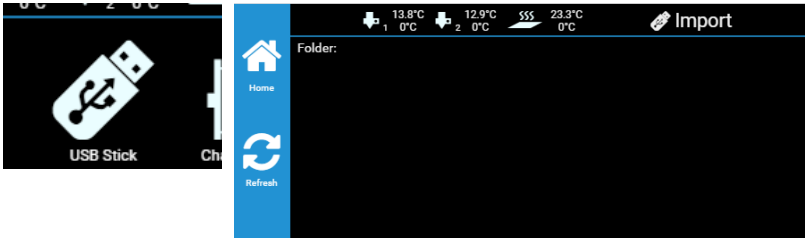
A. Use the already applied Kapton layer on the flex plate and clean it with detergent like methylated spirit or 100% alcohol . It must be absolutely grease free. **Grease from fingers can ruin adhesion to the bed.**

B. Use an adhesive like Magigoo, Pritt Powerstick, 3DLac or similar (recommended for larger prints).

Note: When using a spray adhesives ensure the flex plate is removed from the printer. The spray can damage the linear motion components of the machine.

9 Print from USB stick

Insert the USB stick supplied with the printer and press refresh and press **USB stick** button



A file-list should appear. Select a ***.gcode*** file for direct printing.

When you press the gcode file, you get two options.

1. You can save it to the library of the device or
2. Directly print it from the USB stick. The file is temporarily copied to the screen and the print will start. You can safely remove the USB stick without disturbing the print-process.

Start the PRINTJOB supplied with the printer to ensure proper functioning

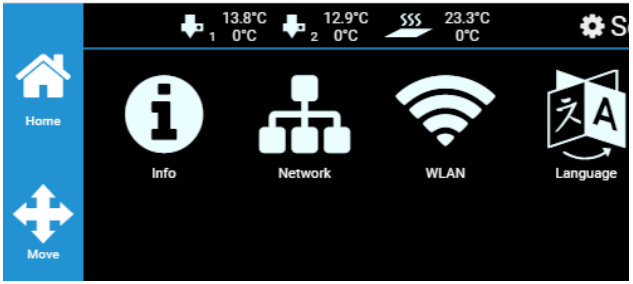
IMPORTANT NOTES/RECOMMENDATIONS

- ✓ **Clean/prepare** the print bed before starting a print.
- ✓ **Never** leave the printer before visually seeing that first layer is printed ok
- ✓ **Always use** filament accessories for proper filament guiding and long lifetime of hot-end.

10 Print and Control printer via WIFI or LAN

10.1 Connect via WIFI

Go to Settings in main menu -> Press WLAN



A list of available networks appears, select your network and insert credentials.

10.2 Wired LAN

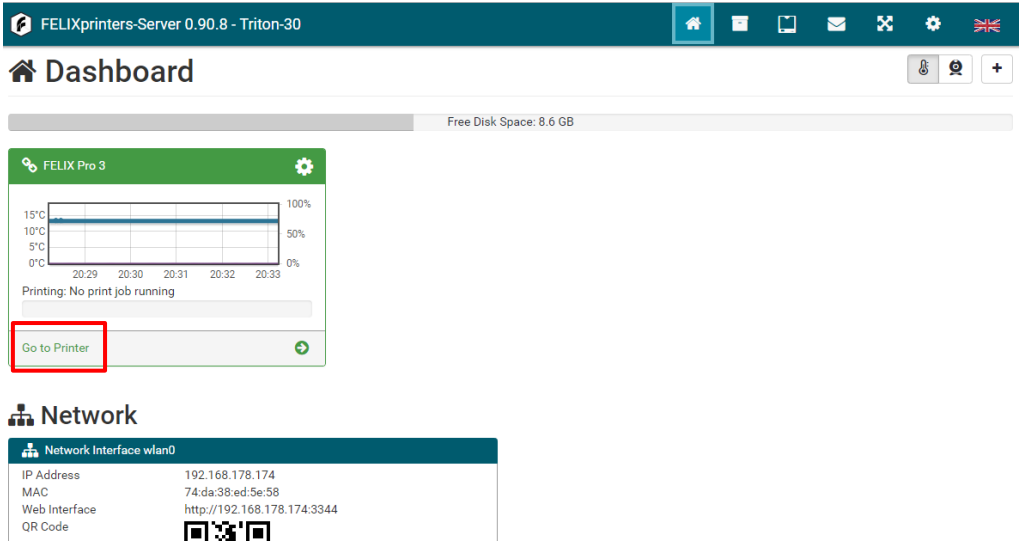
Plug the cable in the rear port on the back of the machine.

10.3 **Remote control**

After connecting printer to a local network, navigate to **Settings -> Network**. And type in the shown IP http-address in your web browser or scan the QR code on the device which is connected to the same network.

10.4 **Print via web interface.**

Overview of the dashboard

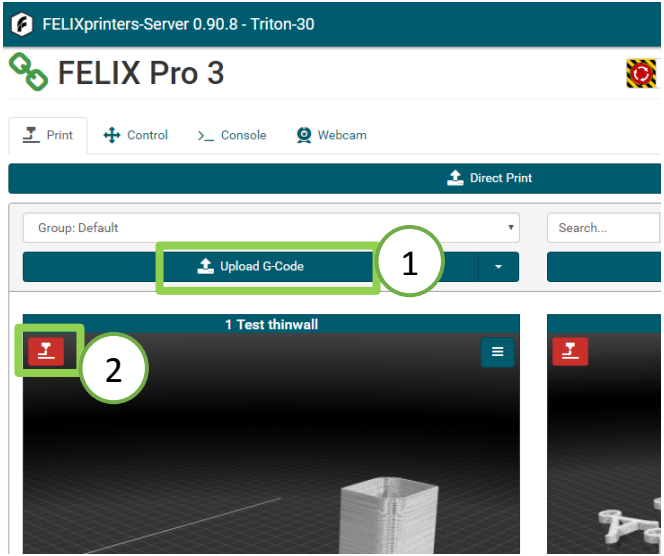


Click **Go to printer**

1. Press **Upload G-Code**, to upload a gcode for printing to the library

   After Uploading the touchscreen will render an Image for printing.

2. Press the print icon, the print will start.



Webcam monitoring

You can conveniently monitor a print-job via the webcam. For now this is only enabled on the internal network. If you want to access this from an external network, a port needs to be forwarded in your router directed to the IP-adress of the printer.

Navigate to the webcam tab for further information

Timelapse

You can create a time lapse video of your print for more information on how to do this please consult the user manual.

11 Tips and tricks

11.1 Flexible Filaments

Our 3d printers can in general handle flexible filaments well. Depending on the amount of flexibility, you might need to take some extra precautions to print it without trouble.

This is a best practice:

Precautions.

1. Ensure you **use the correct slicing profiles** for flexible filaments from our supported softwares.
2. Ensure the **extruders are cleared** from non-flexible filaments. It is essential that the filament does not experience any obstructions in the hot-end barrel, before reaching the hot parts of the hot-end. Otherwise chances of buckling filament inside the extruder are very high. Obstructions can occur if there has been printed with some hard filament before, make sure it is removed from the barrel of the hot-end. This can be done by extruding some hard filament and then fully retract it again. Easy way is to do it via the display unit. Then slowly extrude the filaflex into the hot-end.
3. **Adjust filament clamping range**. The extruder arm pushes filament onto the extruder drivewheel. When using flexible filaments it might be that the filament is squashed too much causing a lot of friction and eventually it buckles and clogs the extrusion.

http://www.felixprinters.com/downloads/1.%20Pro%20Series/2.%20FELIX%20Pro%202/2.%20Tips%20%26%20Tricks/How%20To%20-%20Adjust%20filament%20clamping%20range.pdf

Loading flexible filament.

It is recommended to load filament via the interface at the printer. Goto *Control* => *Change filament* => Choose the correct filament and/or temperature.

1. **Cut the end of the filament in a skew manner.** The extruder gears might find it difficult to get grip onto the first part of the flexible filament which is fed into the extruder.
2. **Extrude filament until the first drip comes out.** Then slowly extrude more piece by piece. Do not extrude in a continuous feed at high speed as that will increase chances of buckling.
3. **Optional: Lower the overall print speed.** Via the display unit take the following steps after starting the print. Press the rotary button. Then scroll down to Speed Mul. And lower it to 50%. Then by trial and error increase the speed.

12 Maintenance

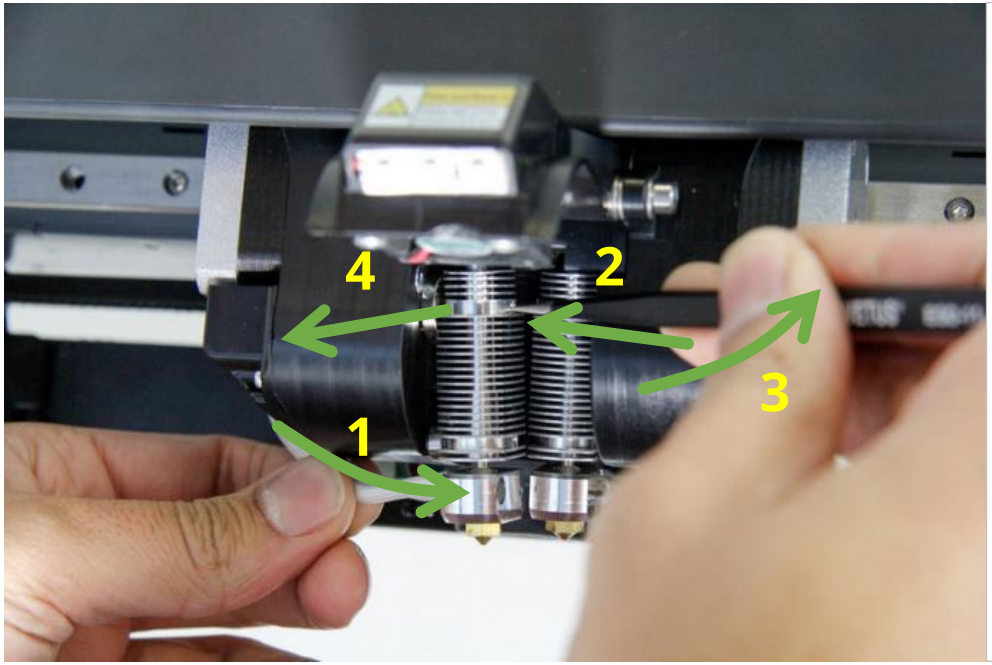
The printer is a quite complex motion system and requires maintenance.

12.1 How to maintain/exchange hot-ends

For cleaning or maintenance purposes, the hot-end can be easily removed from the FELIX Pro L/XL.

Please take the following steps.

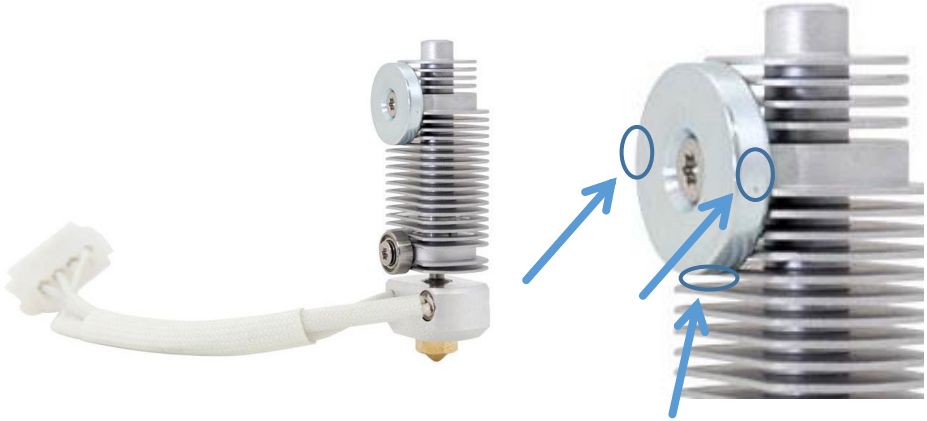
1. Check if there is still filament loaded in the hot-end. If there is no filament loaded, then go to step 4. If yes, from the display unit or PC interface select the correct extruder and heat it up.
2. Retract the filament from the hot-end.
3. Let it cool down.
4. Turn off the printer.
5. Open the cover in front. (picture is of a Pro 2 but the machine uses the same head)
6. Remove hot-end connector of the corresponding hot-end.



1. Push hot-end 3mm inwards
2. Insert tweezers in small hole
3. Rotate tweezers and hot-end should start to come out
4. Pull out hot-end

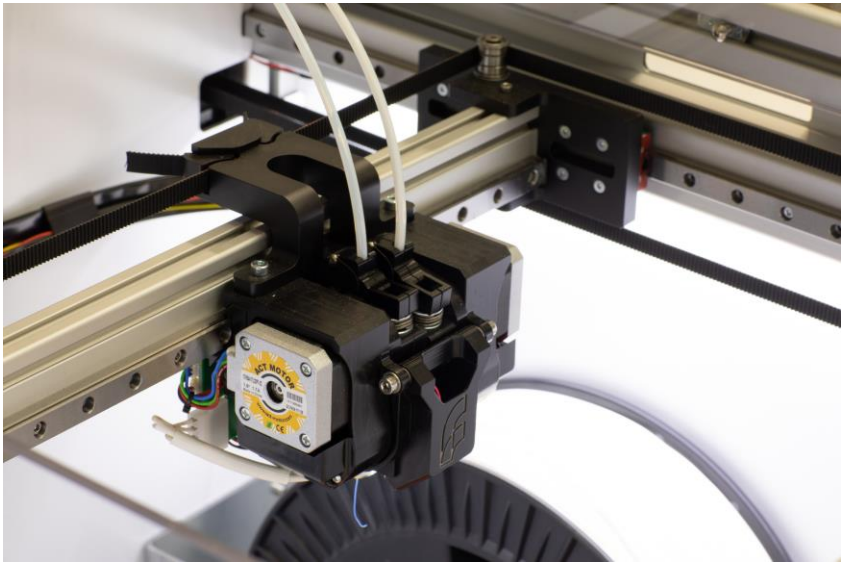
7. Pull connector to the side

8. Inspect hot-end. Check for debris or black spots. Clean the disc.



9. After cleaning, condition the top disc with non-electrically conducting Teflon spray. First spray it on a cloth, then rub it on the disc. On the side and the bottom of the disc.

10. Then Reverse assembly of the hot-end into the extruder assembly. Do not forget to close the lid.



11. Please do the following two extruder calibrations, if you wish to properly print dual head.
    - Z-height calibration
    - XY calibration

Caution: There is a potential risk of burning, as the nozzle can reach temperatures of up to 275°

TIP: Clean hot-end exterior from filament before starting a print, to prevent blobs of plastic on your printed object.

12.2 **Dust cleaners**

Filament attracts a lot of dust and small particles. Make sure the filament enters the filament holder through the dust cleaner. After a few months of printing it is recommended to replace the dust cleaners.

12.3 **Motion system**

The linear bearings require almost no maintenance. Recommended is that you put a little grease on them every 3-4 months.

The belt tension of the x and y axis can also be checked in intervals of 3 months.

13 Display messages

Flow detection

The flow detection system is triggered – the printer moves to its idle position waiting for user action.

The flow detection system is triggered when there is no more filament going through the extruder or when the filament is not extruding at the expected rate. Go to www.felixprinters.com/support to learn more.

Z-sensor error

The z-sensor triggered message should appear only when the tip of the hot-end touches the print bed.

If the message is displayed continuously go to www.felixprinters.com/support to find out how to solve this issue.

Heater sensor error

Extruder: the sensor is defect or not connected properly. Please check if the connector is placed correctly and is clean on the inside.

Heated bed: The bed temperature sensor circuit is defect. That can mean the temperature sensor, or the wiring of this sensor.

Heater error

Extruder: the heater or sensor are giving improper values. Please check if the connector is placed correctly and is clean on the inside.

Heated bed: please check if the contact pins underneath the print bed are ok.

Leveling failed

The z-sensor triggered falsely during the leveling routine or measured probe values are out of their boundaries.

Go to www.felixprinters.com/support and look for the 'z-sensor triggered' topic.

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