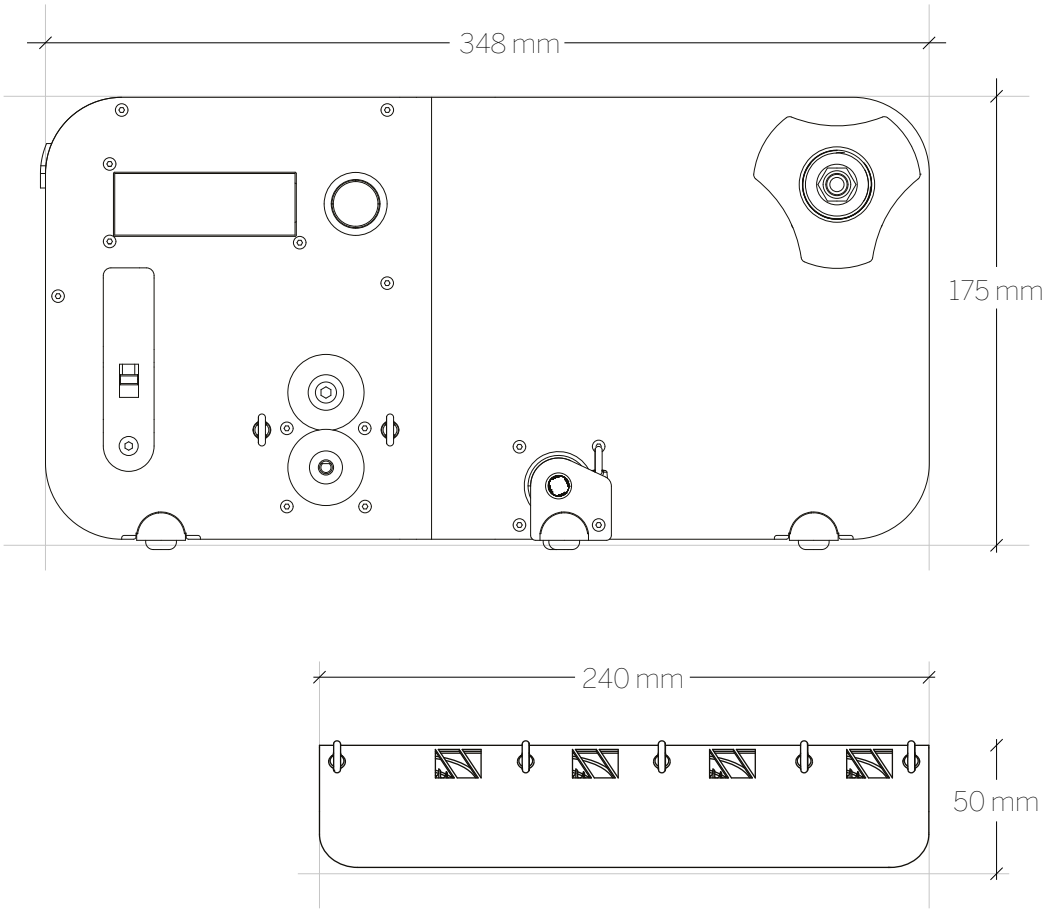
# Felfil

## -spooler-

User Manual




Thank you and congratulation for choosing the Felfil Spooler/Spooler+.

Felfil Spooler is a plastic filament extruder, able to produce filaments for 3D printers starting from industrial pellets or plastics wastes.

This guide is designed to allow you a good experience with Felfil Spooler, please read this manual in all its parts before connecting and operating.

Felfil Spooler is suitable for domestic, research or business use; is wary of improper use.

| | |
|---|---|
| DC input | 12V |
| average power usage (while working) | 30W |
| weight | 3,8Kg |

## Warnings

Felfil S.r.l. does not assume responsibility and expressly disclaim liability for loss, injuries, damage, or expense arising out of or in any way connected with the assembly, handling, storage, wrong use or disposal of the product. Please, read this document before use Felfil Spooler.

Any kind of modification will be at your own risk, and will result in the decay of the warranty. Felfil S.r.l. does not take any responsibility for damage occurred to people or object, caused by such modifications or improper uses.

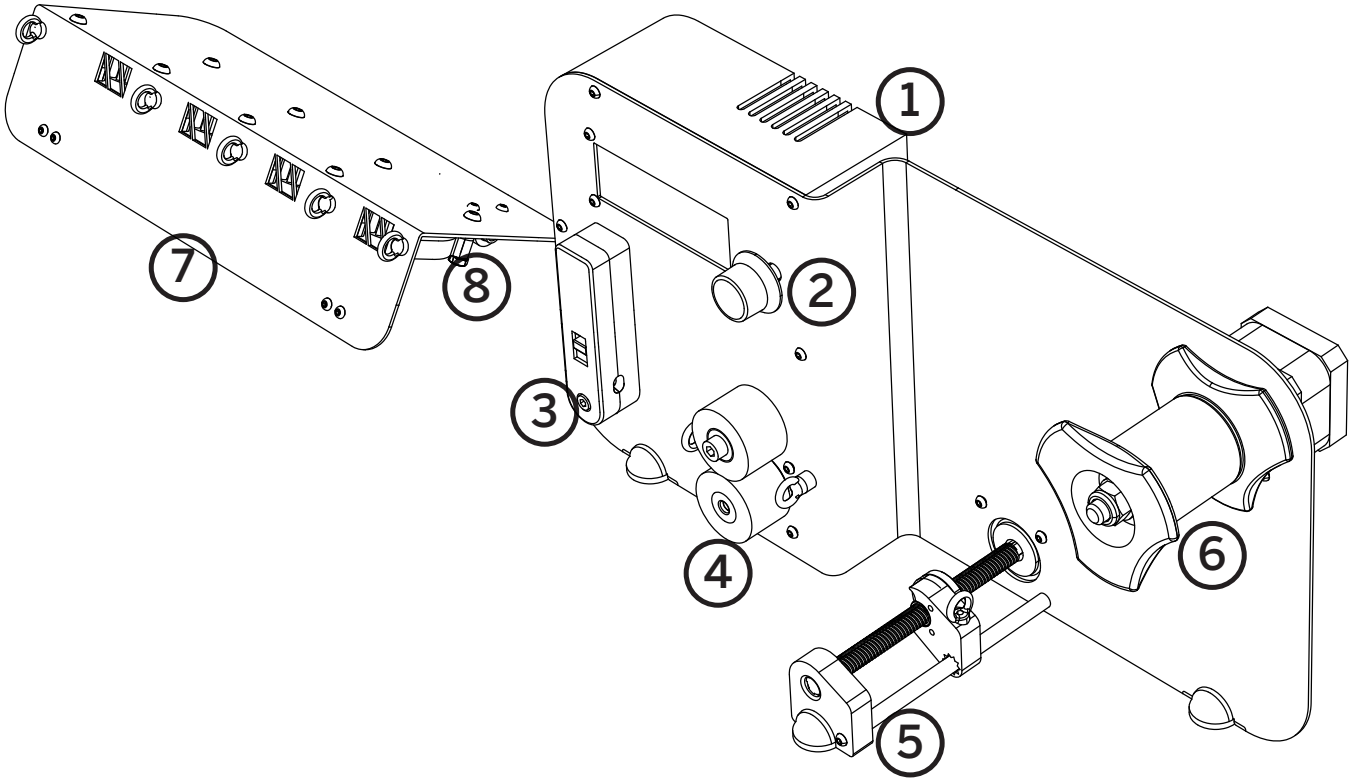
- Do not use vinyl and PVC, they will produce toxic emissions.
- Do not eat or inhale the filament.
- Do not use the machine if any parts are missing or damaged. If you notice any damage to the unit, unplug the device immediately and contact the Felfil team for guidance.

Use the device only with specified input power. Using the device with any other input power is likely to damage the electrical and/or electronic parts of the device.
Remind to keep the equipment out of children's reach.
Use this device only to spool plastic filament for 3D printing. No other use has been tested.

## Caution

- Do not insert your fingers in the moving parts.
- Do not throw water on the spooler.
- Do not hit the spooler and its accessories or you could damage the spooler.
- Please, never try to spool a plastic unless you are absolutely certain you know what type it is.
- Some polymers can undergo thermal decomposition resulting in potentially toxic fumes. So always use the Felfil Spooler in a well ventilated area, or inprecence of a suction hood (not your bedroom or inside your house), and understand the thermal decomposition properties of the polymer you are extruding.
- Be sure to check in on it periodically.

The Felfil Spooler is a first-generation, experimental piece of hardware. Treat it as such.
Basically, use common sense.
If you have questions, write us at support@felfil.com




1 _____ Electronic Cover/Connection

2 _____ Input / Output Interface

3 _____ Misuring System

4 _____ Pulling System

5 _____ Distributing System

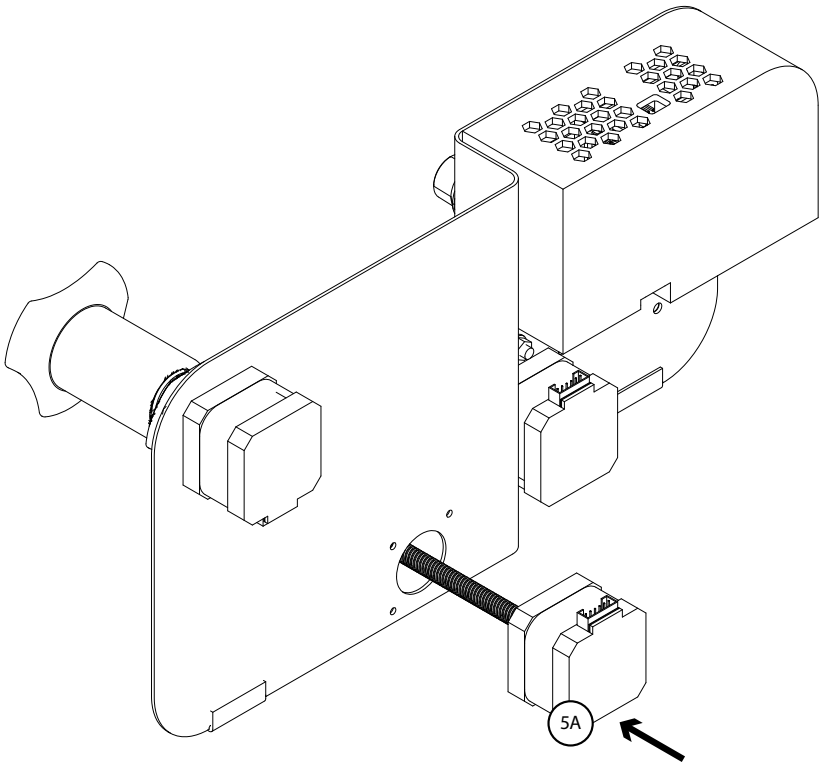
6 _____ Spool Holder / Spinner

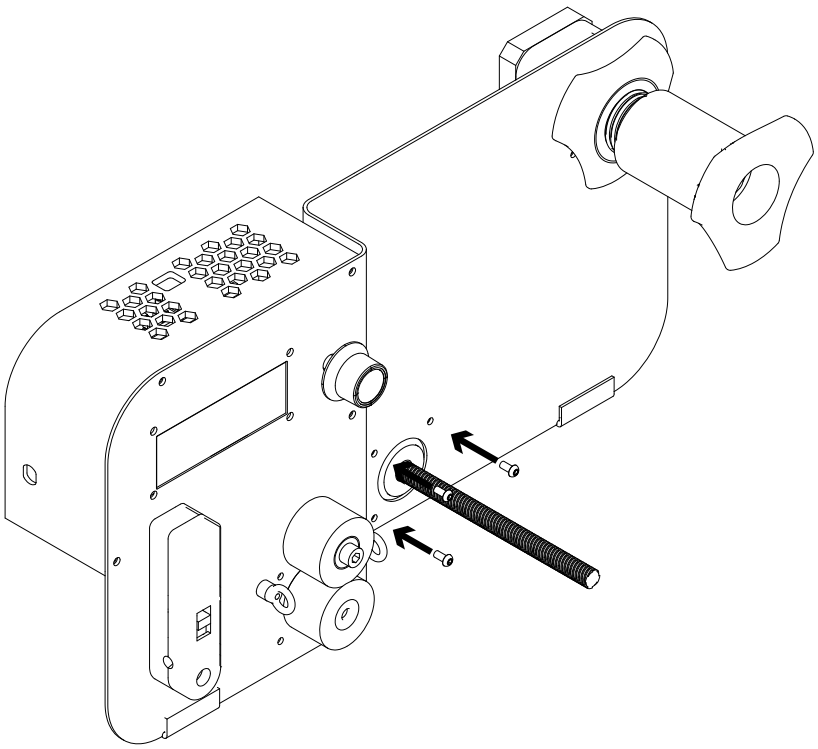
7 _____ Fan Array

8 _____ Fan Array Connection

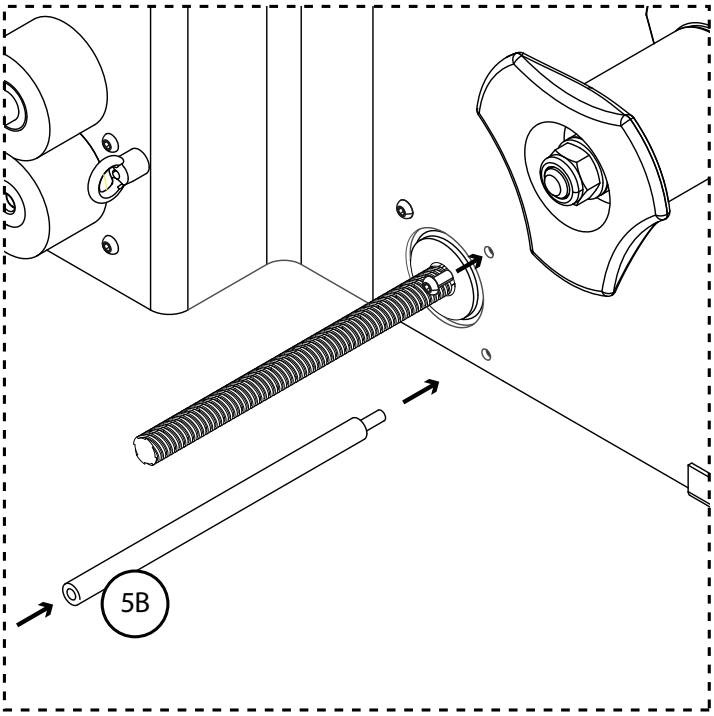
Before using Felfil Spooler some steps are required. Please use the following in

- Insert the leadscrew shaft stepper 5A into its place.  And fix it using three M3 screws, only the left side. The connector must be on the top.

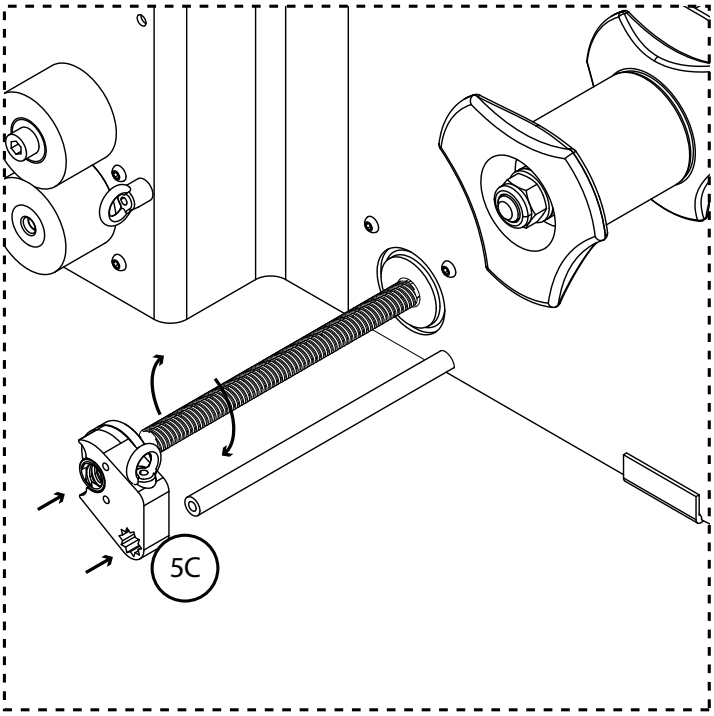


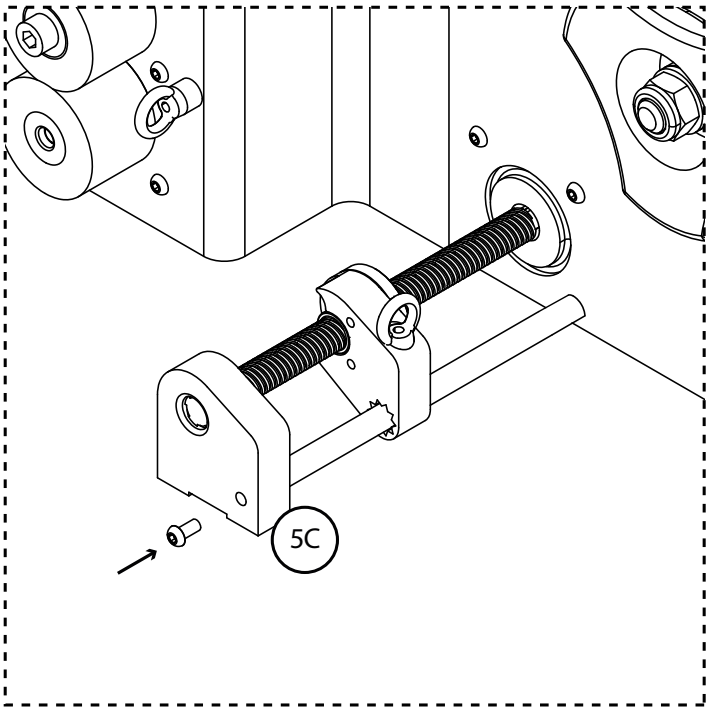
Screw the linear guide 5B into the bottom right hole.



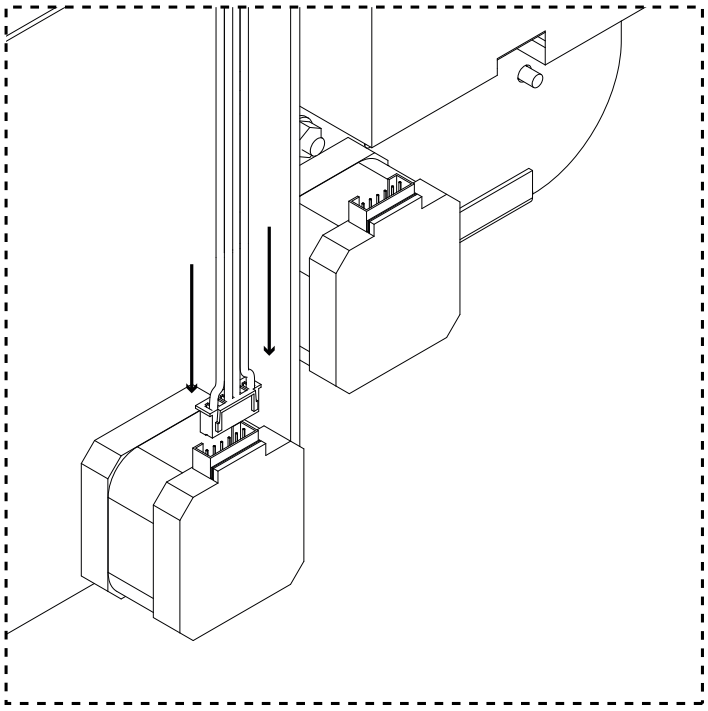

Insert the sliding part  5C in the shaft turning the shaft by hand.



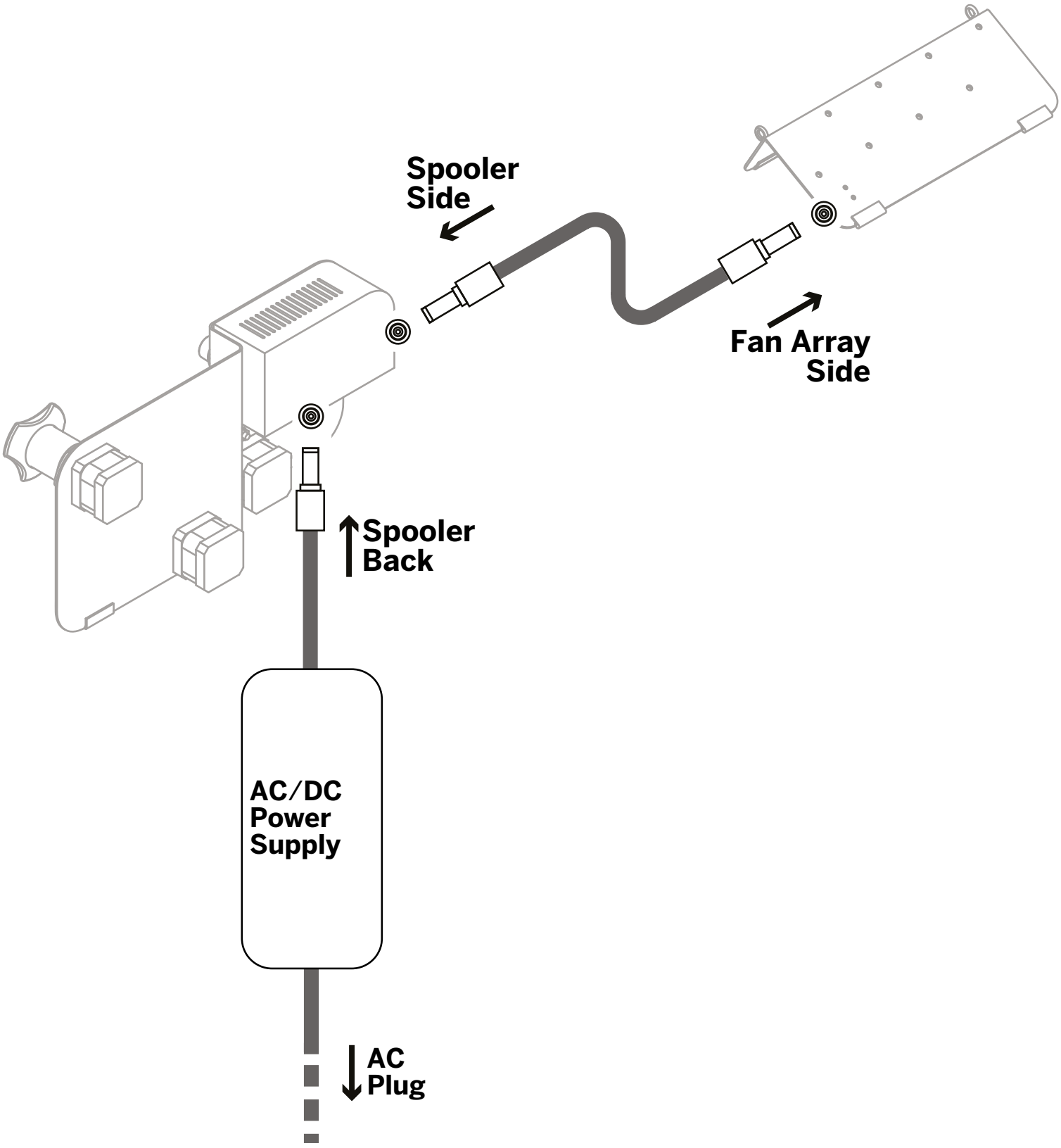
Fix the 5C component using 1 M3 screw.




Connect the leadscrew shaft stepper to its wires connector.

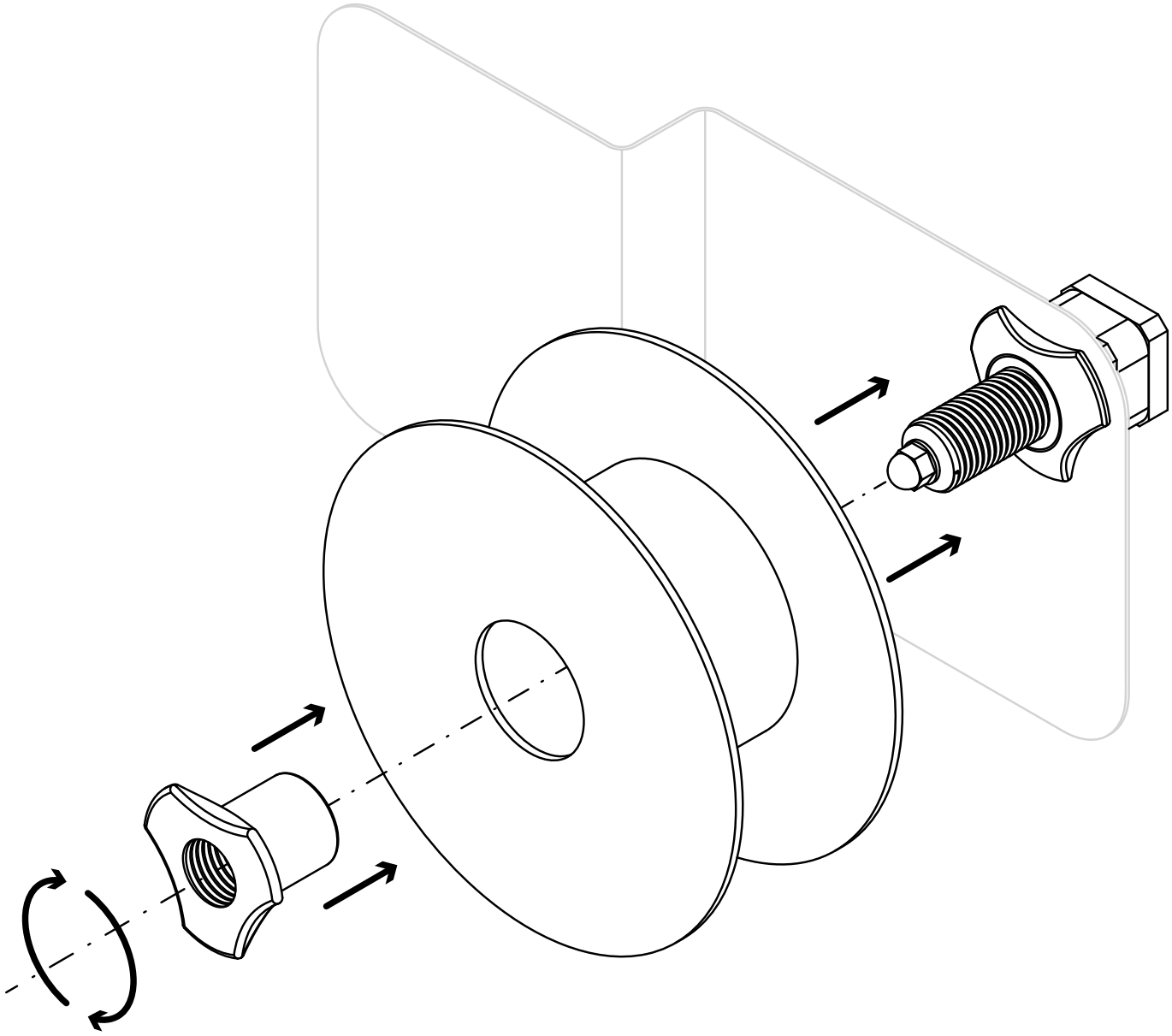


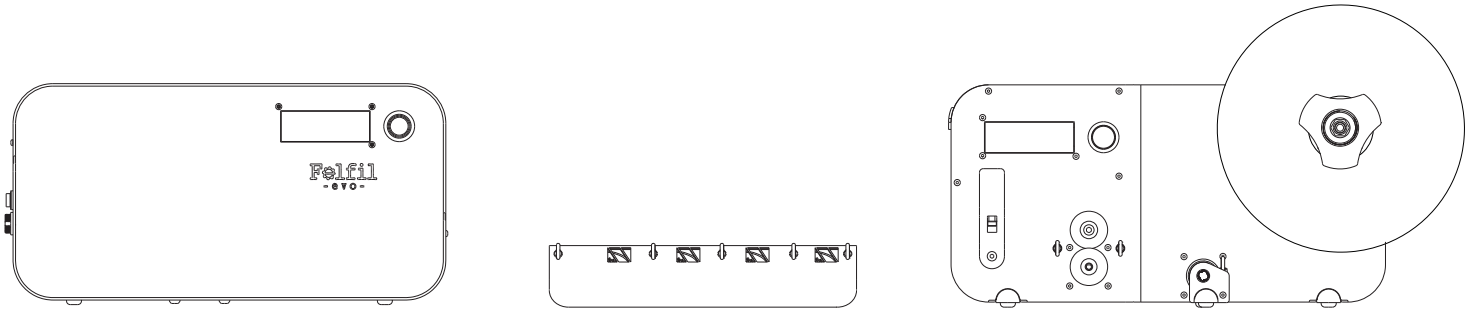
- Connect Felfil Spooler to the fan array using the DC jack to jack cable.
- Connect the power supply.



Insert your empty spool in its support and lock it.

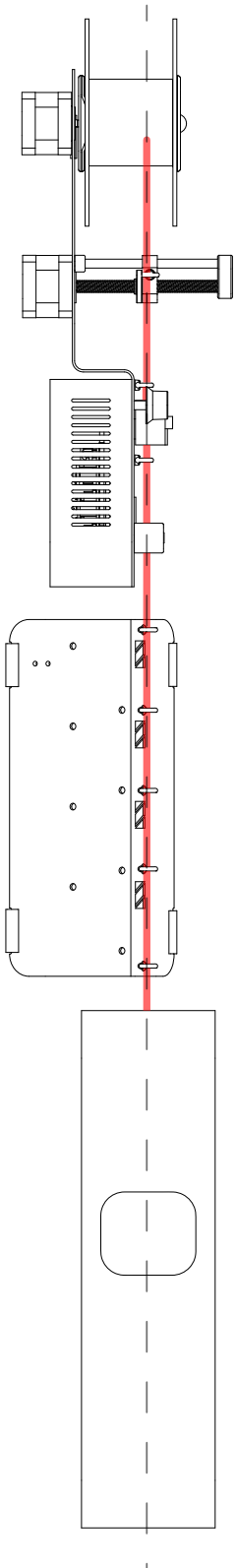
Please note that max size of the spool is 10cm width and 22cm diameter.






from 3cm
to 10cm

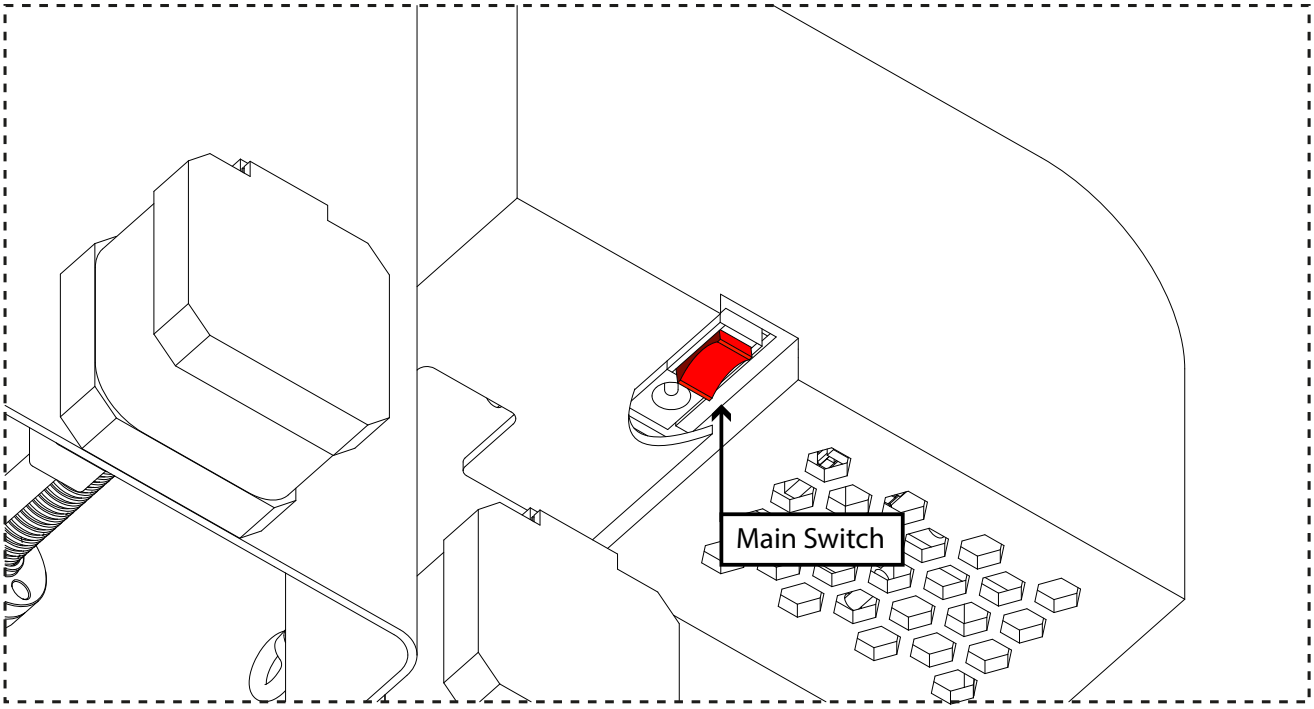
from 3cm
to 10cm



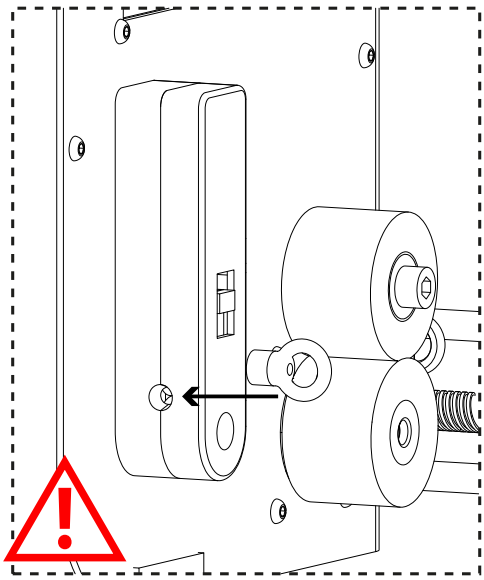
Place Felfil Evo, Fan Array and Felfil Spooler on a table and arrange them like in the pictures.
All the machines must be alligned: allign the Felfil Evo nozzle with the filament support placed on the Fan Array and Felfil Spooler.

! The filament has to be streight ahead, or the extrusion will result compromised.

Turn on the main switch placed on the back of the spooler, near the DC Jack connector.




! The measuring system must be empty!
Otherwise the measure read will be compromised.
Check it, please.



The first screenshot shows a calibration. During this step, you will see the distribution reset. Indeed, every spooling session will start from the left side of the distribution.

! Do not click anything during the calibration process.

Once the calibration is finished, a guided interface leads you to the spooling session. Rotate the knob in order to switch settings and click it to confirm.
The first parameter that you can select is "Set Mode" which indicates the presets used for the diameter control. Every mode is suitable for different materials.

Tested with these materials:
ABS, HIPS, PLA

Tested with these materials:
PETG, TPU (2,85mm needed)

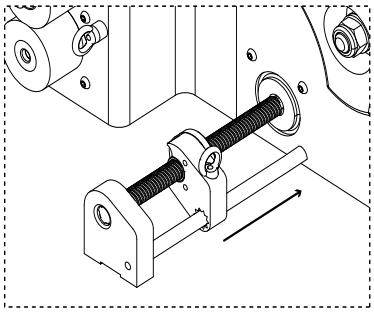
Tested with these materials:
Nylon

In Manual mode the diameter autocalibration is disabled, it will operate at constant speed.
This mode is useful for sperimental materials.

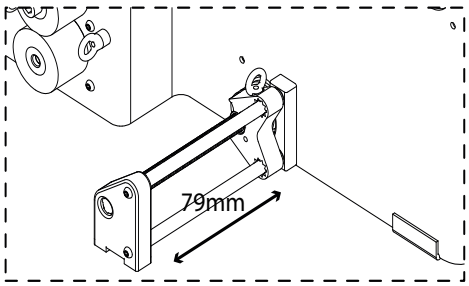
The second parameter is the diameter you would like to obtain.
The sysytem will remember your last choice for the next extrusion.
Click to confirm.

You can set it form a minimum of 0.5mm to a maximum of 3mm.

In this step you have to rotate the encoder to bring the traverse to plate. Stop as soon as you hear noise, since the traverse is attahced to the plate.



This parameter is about the spool width begin. Allign the metal golfare to the spool beginning.




This parameter is about the spool width end. Allign the metal golfare to the spool end.

! Note: the initial value depends from the “Set Spool Begin” value. Max width is 79.

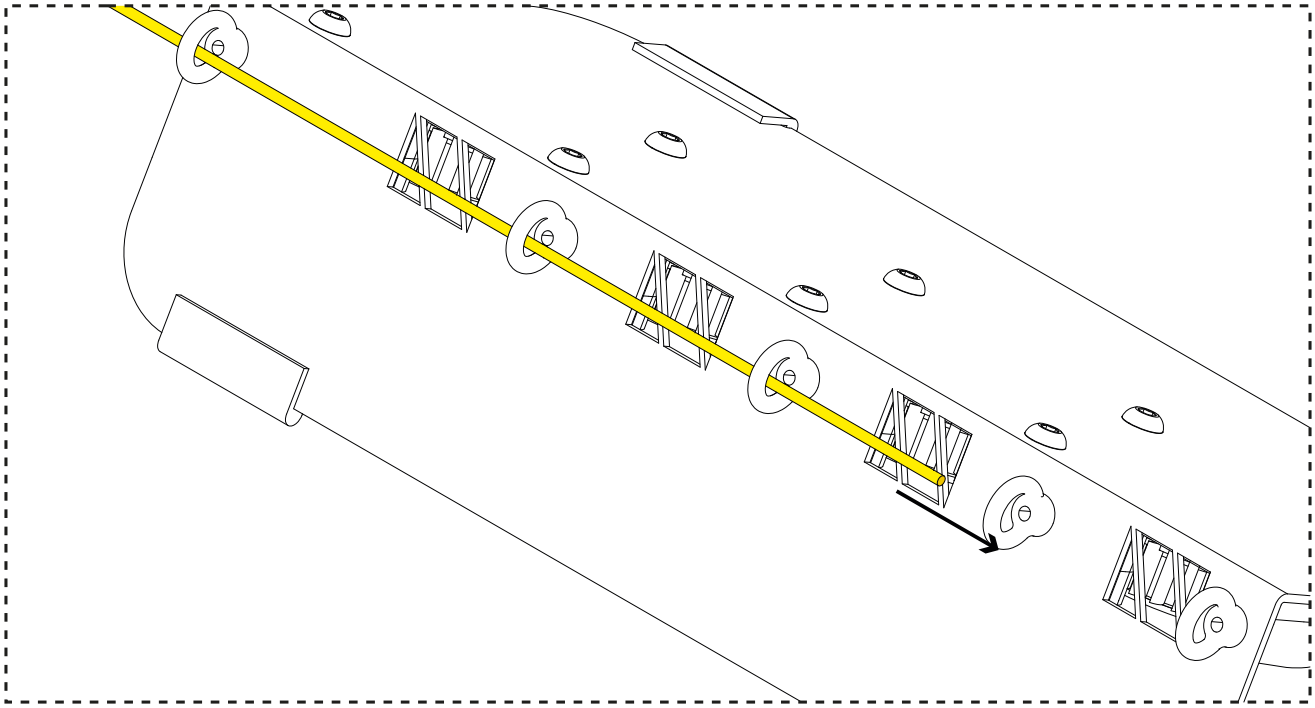
If you are working in “Manual Mode” this parameter indicates the puller whells constant speed (meter per minute). Adjust it according to your extrusion flow.

! This parameter is settable only in “Manual Mode”

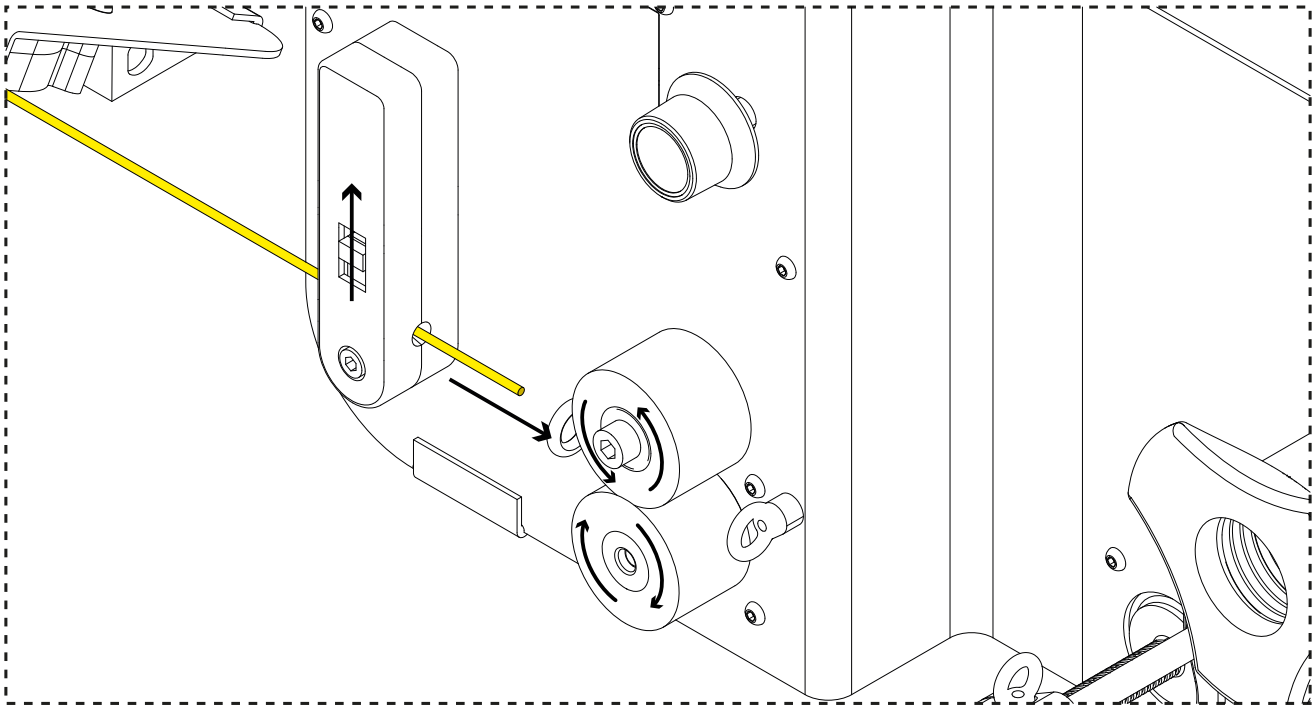
Now Felfil Spooler is ready to be used.

Insert the filament through the proper supports placed on the fan array.

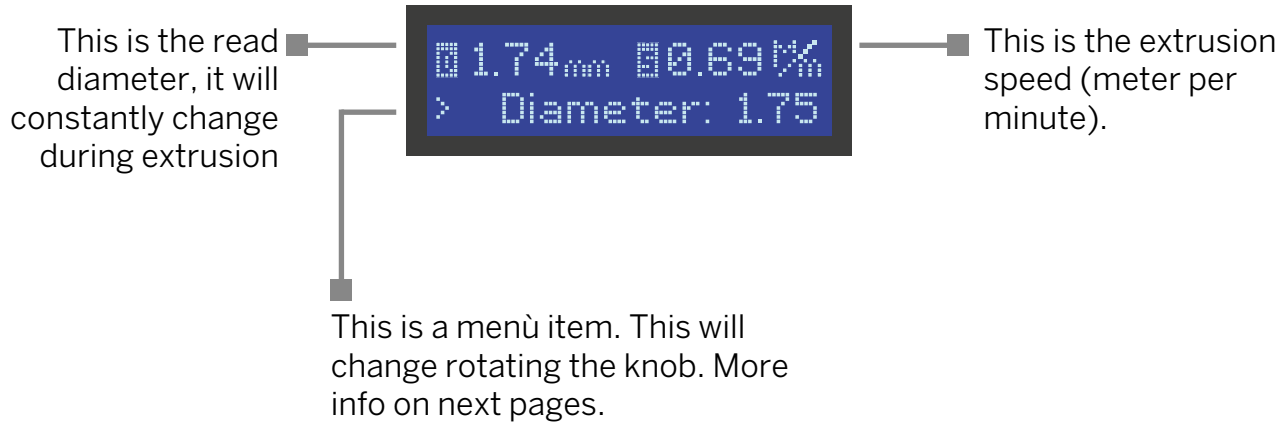
! Use gloves to do this operation. The filament is still hot.
Do not stretch the filament, do this operation slowly.



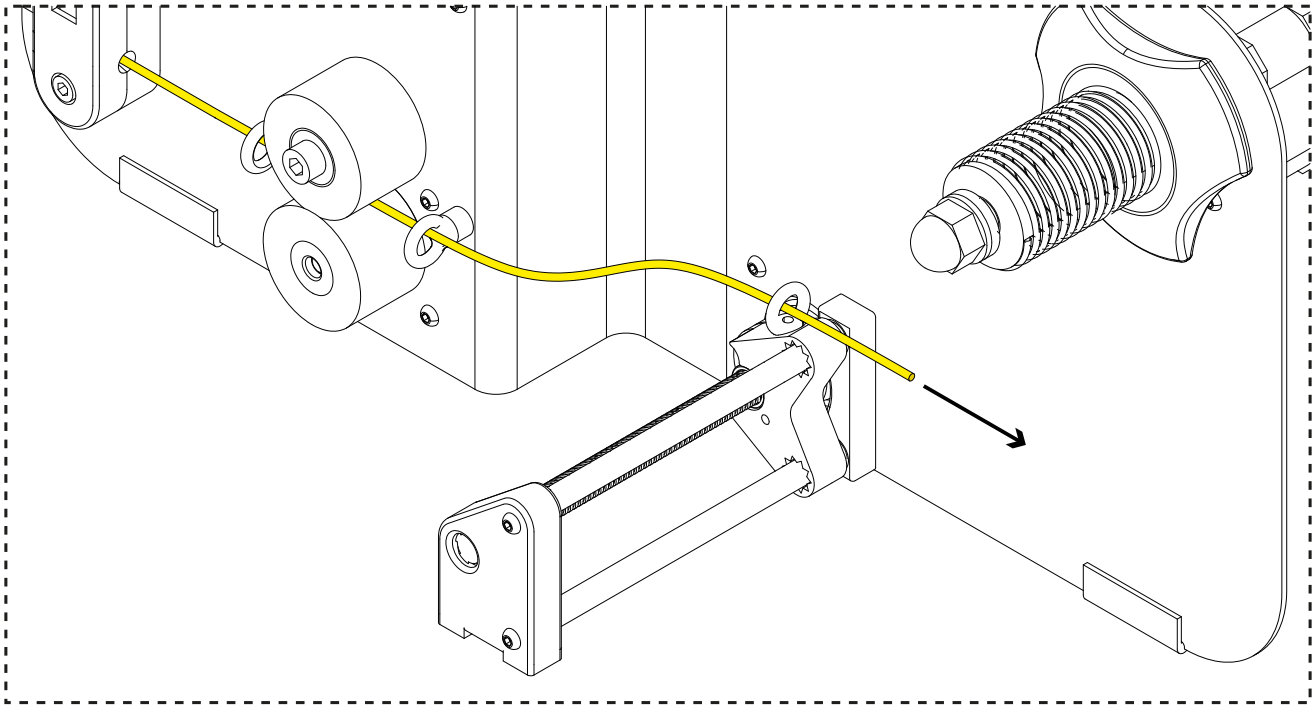
Insert the filament into the measuring system sliding up the little lever.
Once the filament is in position the puller wheels will start rotating.



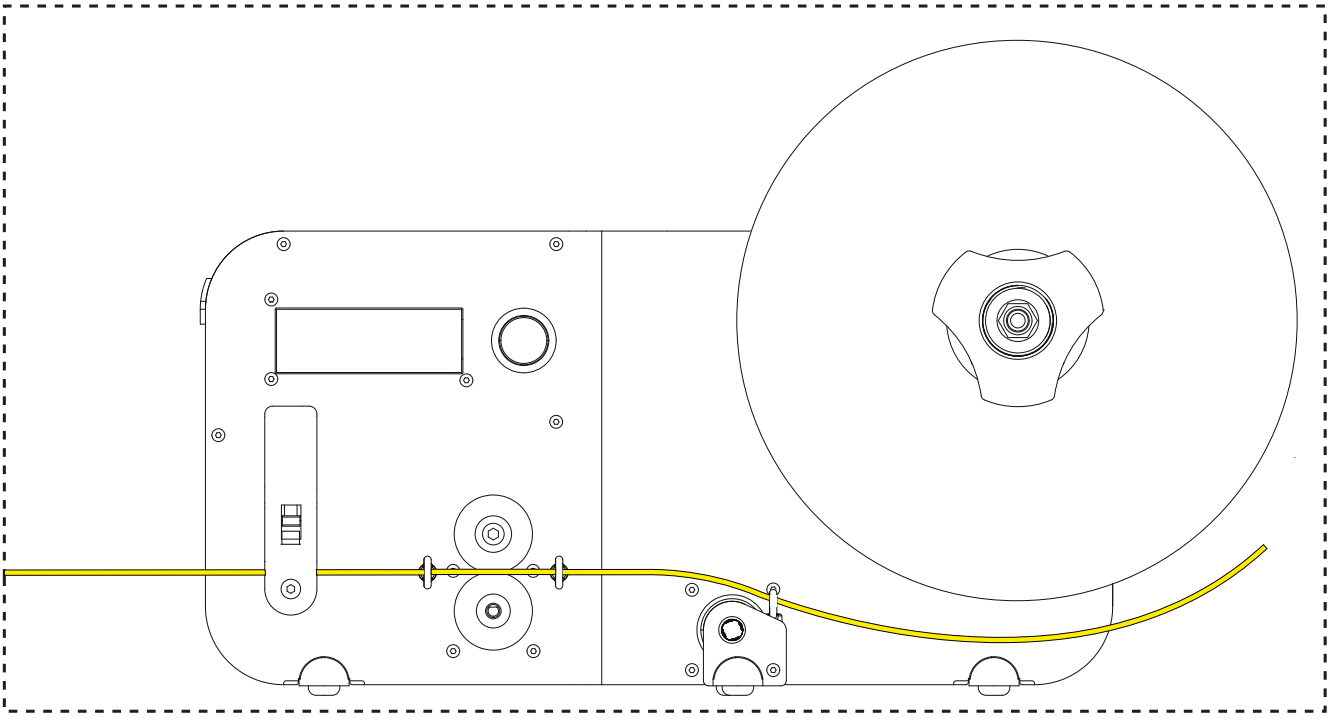
Once the filament is pushed in the measuring system the puller wheels will start to rotating and the following information will appear. This is the main working interface of Felfil Spooler.



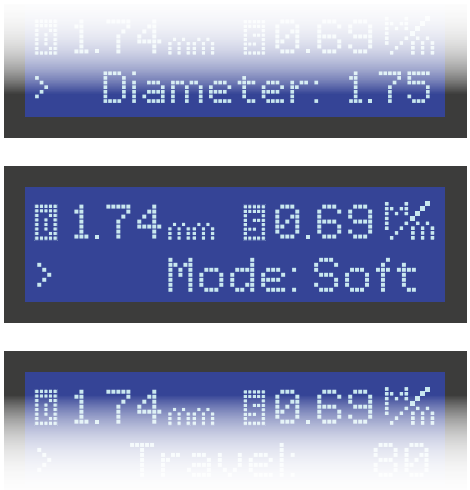

Let the filament pass through the supports and between the puller wheels. Then guide it in the distribution support.

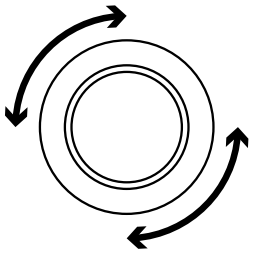


The filament must pass under the empty spool. Let it go until the diameter will remain quite constant. Then you can fix the filament to the spool.

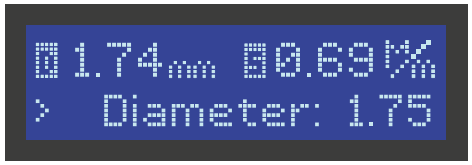


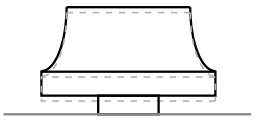
Use the following gestrures to navigate into the menu.



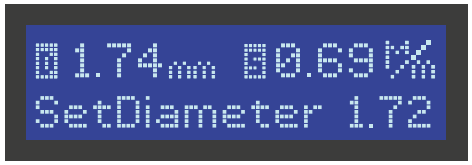



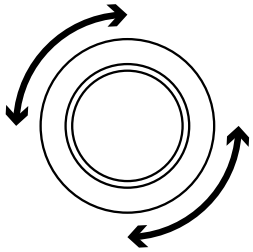
Rotate to navigate between menu items



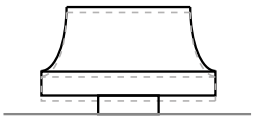



Push to enter in menu item

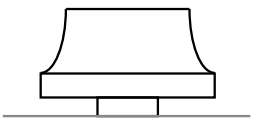


Rotate to select the parameter

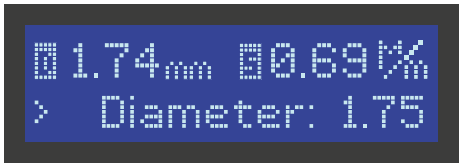


Push to confirm



Long push to reset the machine

Listed below there are all the parameters (menu items) that you can modify every time you need during the extruding session.




Filament diameter desired.
From 0.5mm to 3mm

Preset for auto measuring and calibration.
See page 12 for more information.

It allows to calibrate the measure, use it if the real measure is different form the one you read. Example: measure an hex key using a caliper. Then insert teh hex key into the measur system, if the measure is not the same, regulate the offset.

Travel distribution Speed. By default is set on “4”. This parameter can affect the filament distribution.

Puller wheels constant speed. Adjust this parameter according to your extrusion flow.
Available only in “Manual Mode”

Spool Speed. Modify this parameter if the spool clutch is not working properly for your material, or if your extrusion flow is over 1,5m/m. Value in RPM.

Fan Speed. You can modify the airflow of fan array if necessary.

Here you can see the meter of filament extruded during the session.

Unit of Measure:
Puller speed: meters/minute
Travel speed: millimeters/minute
Spool speed: revolutions/minute

## ? Usage

For a correct usage of  Felfil Spooler please follow these suggestions:

- Place it on a flat and stable surface before operating (a table is quite good);
- Do not place anything near Felfil Spooler, it requires unrestricted airflow, for cooling, proper operation and to protect the electronic components from overheating;

The first meters of filament will be inconsisten on diameter. Do not use this filament in your 3D printer.

If you have any problems using Felfil Spooler, contact support@felfil.com.

## ? Maintenance

Felfil Spooler needs some occasional maintenance:
- Clean it regulary
- Be sure that every part can spin properly
- Use always gloves while working on still hot components.

In this section you can find some information about the plastics you can extrude with Felfil System.

We do reccomend to always dry the material before extrusion.

When using commercial pellets, rely on the maker's identification of the type of plastic. When using recycled plastic, check the markings on the item(s) to determine which type of plastic you are using.

Do not mix types of plastic, as this may affect processing times, both in the extruder and in the printer.

The following is a table of general processing temperatures. Notice that the processing tem-perature may not be the same as the melt temperature.Temperatures will vary based on: humidity, ambient temperature and chemical composition of the polymers.

| | MFR | Density [g/cm3] | T [°C] | Speed [rpm] |
|---|---|---|---|---|
| PLA | 6 | 1,3 | 187 | 6 |
| ABS | 19 | 1,04 | 205 | 9 |
| HIPS | 4 | 1.04 | 200 | 9 |
| TPU (2,85 nozzle) | - | 1,22 | 205 | 8 |
| T45 (pc+abs) | 4 | - | 190 | 9 |
| HDPE | - | 0,94 | 200 | 9 |
| PETG | 8 | 1,23 | 209 | 6 |
| Nylon | - | - | 240 | 9 |

NOTE: The temperature ranges in the chart are approximate. It will require some trial and error to determine the right processing temperatures. Keep notes of actual temperature settings with different types of plastics, along with other operational notes, to develop a procedure that works well in your situation.

Contatti:

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Download the last version of this manula from: felfil.com/support/
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