

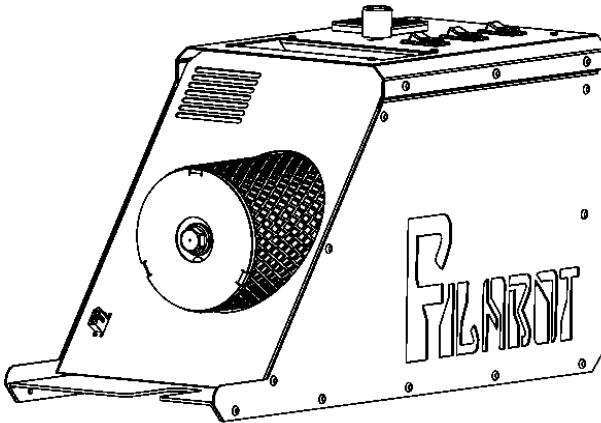
Filabot  
Vermont, USA, Earth  
1-802-505-6772



---

## Filabot Original and Filabot EX2 Operation Manual

---



---

This manual applies to the Filabot Original and Filabot EX2 by Triex LLC.  
Triex LLC, Barre, VT 05641, USA

EXOGMR1 – REV 3 – 9/18/2019

# General Specifications and Application

---

The Filabot EX2 is a filament extruder system, which produces plastic filament for 3D printers.

Filabot extruders produce plastic filament in 3 common diameters: 1.75mm, 2.85mm, and 3mm. Custom size nozzles can be ordered on [Filabot.com](http://Filabot.com).

The Filabot Original and Filabot EX2 can produce filament from a wide variety of plastics that can be in pellet, re-ground plastic, and in fine powder form. Input material should be less than 3mm in diameter.

**Inputs:** The following plastics have been verified for extrusion on the Filabot Original or EX2. Other plastics may be extrudable, however they are untested. We are constantly testing new plastics, please contact us for the most up to date information on verified plastics. Also, check out our *Learn Tab* on [Filabot.com](http://Filabot.com) for our *Public Filabot Extruder Settings* for fine-tuned settings on some of our polymers.

- PLA (Polylactide)
- ABS (Acrylonitrile Butadiene Styrene)
- HIPS (High Impact Polystyrene)
- ULTEM
- PC (Polycarbonate)

**Electrical requirements:** 100VAC - 240VAC 50/60Hz

**Power Consumption:** The Filabot Original and Filabot EX2 will use 300 watts max, depending on heater temperature settings and motor speed.

**Filament Diameter Output:** 3mm, 2.85mm or 1.75mm diameter plastic filament, using provided interchangeable nozzles. The customer may also purchase pre-drilled nozzles or modify them for a custom diameter.

**Dimensions:** 18 1/4in x 7in x 9 1/4in (46cm x 18cm x 24cm)

**Weight:** 20 pounds (13kg)

# CAUTION! Read Carefully

---

- **HOT MATERIALS & SURFACES** Use gloves and eye protection while operating the EX2 Extruder. The barrel and nozzle are HOT and melted plastic can stick to the skin and cause serious injury.
- **HIGH-PRESSURE EXPLOSION** Air trapped inside the barrel becomes highly pressurized during operation and can cause small explosions out of the nozzle which will throw molten plastic away in any direction.
- **TOXIC FUMES** Some plastics like PVC can produce dangerously toxic fumes when they are heated. Always carefully review the MSDS of any material before using it in the EX2 to avoid dangers to your health. Always use the EX2 in a well-ventilated area.
- **In Case of Emergency** pull the power cord out of the machine.
- Only use the EX2 to extrude thermoplastic polymers. No other use has been tested or approved by Filabot.
- Always STOP the extruder before clearing the feed port or removing the screw. Never stick anything into the feed port while the screw is turning as this could damage your system.
- The EX2 is designed for indoor use only. Operate in a clean, dry area.
- Check the AC input voltage specified on the S/N Label near the power inlet. Only use the specified input voltage to operate the EX2 or damage to the components could occur.
- Do not use this device if any parts appear missing or damaged.
- Do not modify this device without authorization from Filabot.

Contact Filabot with any questions  
1-802-505-6772  
[contact@filabot.com](mailto:contact@filabot.com)

# Setup

---

Position the Filabot on a suitable work surface. The work surface should be large enough to safely support the extruder at a comfortable height for the user. Additional space is ideal for convenient access to tools and supplies. The device must be located no further away from an electrical outlet than the length of the provided power cord.

Do not place any objects against the Filabot.

# Operation

---

**PLASTIC NOTE:** When using commercial pellets, rely on the manufacturer'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 cause issues extruding or affect processing times, both in the extruder and in the printer.

The following is a table of general processing temperatures. Note that the processing temperature may not be the same as the melt temperature. Check out our *Learn Tab* on Filabot.com for our *Public Filabot Extruder Settings* for fine-tuned settings on some of our polymers.

Plastic Type	Processing Temperature
PLA	175°C - 195°C
ABS	165°C - 185°C
HIPS	175°C - 195°C
Ultem	350°C - 400°C
PC	250°C - 320°C

**NOTE:** *The temperature ranges in the chart are approximate. Plastics of the same type are available in different grades; each grade may perform differently.*

# Operation (continued)

---

It may require trial and error to determine the right processing temperatures as the ambient temperature you are extruding in will affect the extrusion. It will help to maintain a log of actual temperature settings with different types of plastics along with other operational notes. This will assist in developing a procedure that works well in your application. Blank pages are provided at the end of this manual for this purpose.



**Break-in Procedure:** These steps need to be followed with a new Filabot extruder to ensure proper break-in. These steps are to clean out the extruder from the manufacturing process. This should be done in a well-ventilated area. For general cleaning steps look at the Cleaning and Maintenance section of this manual.

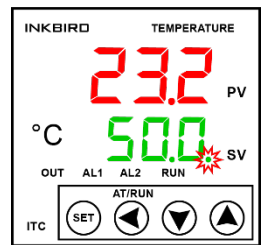
1: Install the supplied 2.85mm nozzle. Use a  $\frac{5}{8}$ " socket or wrench to tighten the nozzle into the end of the extruder. This can be done with the extruder unheated.



2: With all switches off, flip the 'MAIN POWER' and 'TEMPERATURE CONTROLLER' switches from 'OFF' to 'ON'.

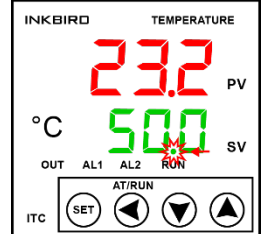
### 3: Tuning – Initial Use

Set the PID controller to within  $\pm 30^{\circ}\text{C}$  of your expected operating temperatures. For break-in we recommend setting the extruder to  $180^{\circ}\text{C}$ .

- a. To program the set temp, press the  or  key once, and the decimal point will flash at the first selected digit:

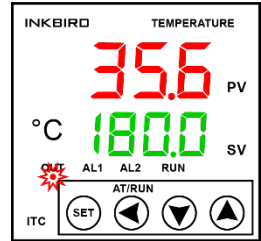


- b. Use the  and  keys to adjust the selected digit value. Use the  key to select the next digit:



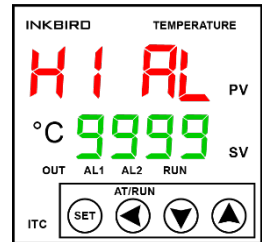
## Operation (continued)

- c. Once the set temp is adjusted to the desired value, press the **SET** key twice to set the value. The “OUT” indicator will turn on when power to the heaters for that zone is switched on:

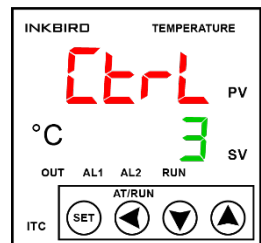


Be sure the measured temp “PV” is at least 30°C cooler than your set temp “SV” before starting self-tuning function. Doing this increases the accuracy of the calculated PID parameters. If temperatures reach the set temp before self-tuning can be started, set all temperatures low until temperatures decrease. Return set temps to your previous setting, then begin self-tuning the controllers:

- d. Hold the key **SET** until the display shows “HI AL 9999”:




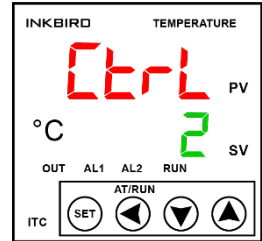
- e. Press the **SET** key 5 times until the display shows “Ctrl 3”:




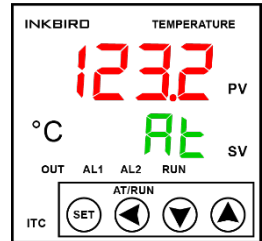
## Operation (continued)

---

- f. Press the  key once to change the value to "2":



- g. Hold the  key to scroll back to the main display. "PV" will display the current temp, and "SV" will flash between "At" and your set temp while the auto-tuning function is running:



**NOTE:** While the auto-tuning function is running, temperatures will overshoot the set temp significantly. This is normal during the tuning process which can take around ½ hour. After the "At" function completes, wait until the temperatures stabilize at their set temp before beginning to extrude. To ensure the PID controllers perform at their highest accuracy, we recommend re-tuning whenever operating at a temperature more than 30°C higher or lower than the temperature the previous tune was set at. For advanced users, the full Inkbird manual can be found on the EX2 page at [Filabot.com](http://Filabot.com).

6: Once 180°C is reached, fill the hopper of the extruder halfway with the supplied pellets, next, flip the 'EXTRUDE' switch from 'OFF' to 'ON'. This will activate the feed screw and begin conveying material forward. Light smoke may come out of the extruder at this point. This will only occur during the break in procedure.

7: As filament begins to extrude, guide it to the ground so that it can coil up. This filament will likely have debris and contaminants in it from the manufacturing process. Do not use this filament in your 3D printer. Extrude all the pellets that were placed in the hopper, if the filament

## Operation (continued)

---

coming out still appears to have contaminants after this step, extrude additional pellets to further clean the system.

8: Discard the 'break in' filament that was just extruded.

### **Filament Production:**

1: Select the nozzle for the size filament you desire to make. ANYTIME after first use will require you to heat the system up before switching nozzles, doing otherwise could damage the machine or components inside. Once the extruder is up to temperature, and the 'EXTRUDE' switch is off, you can remove the nozzle with a  $\frac{5}{8}$  socket or wrench. Be mindful that you are working with hot materials, BE CAREFUL when removing the nozzles, and never touch with your hands. Once the nozzle is removed, replace it with your desired size.

2: With the extruder at the correct temperature for the plastic that is being extruded, add pellets to the hopper and flip the 'EXTRUDE' switch from 'OFF' to 'ON'.

3: If using our Filabot Spooler system, refer to the Spooler operation manual on how to set it up. If you do not have a spooler, you can use the ground coil method. Place the extruder so that the front (where the filament comes out) is next to the edge of a table. The table should be between 24in to 40in tall.

4: Once enough filament has extruded to the ground, guide it into its natural spiral. Once it has spiraled around twice it generally will take care of itself and continue to neatly coil. Be sure to extrude your coil onto a clean surface to avoid contaminants collecting on your filament.

5: After the filament has coiled a few more times, carefully measure the filament diameter from the filament in the coil. If filament is too large, increase the temperature of the of the extruder by a few degrees. If the filament is too small, lower the temperature by a few degrees. Dial this in for your desired diameter.

6: Once you have extruded enough of your filament you are now ready to either spool it or feed it directly into your printer.



# Care and Maintenance

---

Filabot extruders require only minimal, occasional maintenance. This consists of cleaning the device as needed, vacuuming out the hopper, or purging out the plastic inside the extruder chamber.

Check for any signs of damage, wear, or deterioration while using and cleaning the device. If there are any signs of wear, overheating, or deterioration, contact Filabot for guidance on how to proceed.

## **Purging procedure when switching materials:**

- 1: Remove any remaining pellets from the hopper. With the extruder at the proper extrusion temperature for the plastic, begin extruding and run the unit until plastic is no longer coming out of the nozzle.
- 2: Flip the 'EXTRUDE' switch to 'OFF' and remove the large nozzle from the end of the extruder and pour roughly 1/4 hopper full of purge pellets into the hopper. Flip the 'EXTRUDE' switch to 'ON' and begin extruding the purge compound with the nozzle removed. Depending on what you were extruding previously, you may need to use additional pellets to fully purge the material. Use additional purge pellets until the purge coming out is back to its normal white color.
- 3: With the purge pellets fully extruded, add your base resin that you plan to extrude next into the hopper and continue to extrude with the nozzle still removed. Once your base resin appears pure and without any purge remnants in it, run the unit dry, shut down your extruder, and replace the large nozzle.
- 4: You are now ready to begin extruding your new filament.

# Troubleshooting

---

Use the below grid to resolve common issues.

<b>Problem</b>	<b>Possible Issue</b>	<b>Solution</b>
Extruding slow	-Low temperature -Bridge/block	Raise temperature
Not extruding	-Low temperature -Bridge/block	-Raise temperature -Raise temp. to 30°C-50°C cover the extrusion temperature. Let it stand, begin trying to extrude again
Bubbles in filament	-Too high temp. -Damp plastic	-Lower temp. -Dry plastic
Filament diameter too small	Temperature too high	Lower temperature and recheck after two minutes
Filament diameter too big	Temperature too low	Raise temperature and recheck after two minutes.
Main power not turning on	-Blown input plug fuse -Power supply tripped	Replace fuse with the correct voltage fuse Unplug unit for 5 seconds to reset power supply

If problems persist, please call or email Filabot for further assistance.

## **Warranty Information**

---

The Filabot Original and Filabot EX2 have a one-year warranty. This includes replacement of any part that fails. More information about our warranty is available on [www.filabot.com](http://www.filabot.com).

## **Parts, Supplies, and Accessories**

---

Filabot provides replacement parts, supplies, and accessories. If you have any questions or need any special parts, please let us know.

2019, Triex LLC, Barre VT, USA. No part of this manual may be copied, stored, transmitted, or otherwise released without the express written consent of Triex LLC. This manual applies only to the Filabot EX2. While Triex LLC has applied all possible caution in producing this manual, we urge the customer or user of this device to contact Triex LLC with any questions or concerns about operation, before operating the device or making any adjustments. Triex LLC provides no assurance of applicability of the product to customers' requirements.

