IFD-175 EX INLINE FILAMENT DRYER USER MANUAL

Controlling and/or maintaining moisture levels in your filament is essential to every successful 3D printing job. Ensuring consistent moisture control can be frustrating, time consuming, and wasteful.

Introducing the IFD-175 EX, the latest advancement in inline filament drying from Thordsen 3D. Our new *(patent pending)* Drying Unit is designed to adapt to virtually any hobbyist or professional grade 3D printer available.

It uses a combination of heat, desiccant, and air flow to extract moisture and maintain stability of all types of 1.75mm filament. Additionally, it is double insulated to maintain constant internal heat while increasing user safety.
The multi-colored desiccant makes it easy to monitor.

The IFD-175 EX is a plug-and-play system designed to get you up and running quickly. It can be used as a standalone drying solution or as a companion to passive drying methods like oven baking and using a dehydrator.

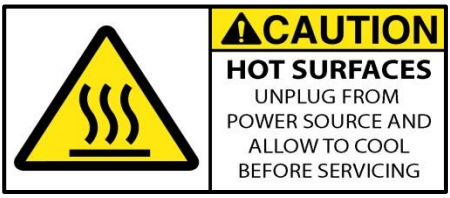
The IFD-175 EX Control Unit is built using the highest quality components available. It is rigorously tested and calibrated at our facility to exacting standards and provides precise temperature control and stability to within +/- 1.0^{o} C.

Installation Instructions Rev 2023-05 Thordsen Customs LLC

SATISFACTION GUARANTEE

Thordsen 3D stands behind the quality and craftsmanship of our Inline Filament Dryers. With confidence, we offer an unconditional 30-day satisfaction guarantee and a one-year limited parts warranty. Your satisfaction is our priority and we are committed to providing you with a product that exceeds your expectations.

For more information, visit our website at: **http://thordsen3d.com/guarantee/.**



WARNINGS

PLEASE READ THE ENTIRE MANUAL BEFORE USING

PERFORMING ANY OF THE FOLLOWING WILL VOID THE WARRANTY

1. **DO NOT ATTEMPT TO DISASSEMBLE THE DRYING UNIT.**
   Our Drying Units are assembled under clean conditions using specialized tools and techniques. Once disassembled, reassembly will not be possible.
2. **DO NOT MODIFY ANY COMPONENTS.**
   Drilling, cutting, or other modifications may damage the product.
3. **DO NOT BREAK THE QUALITY SEAL ON THE CONTROL UNIT.**
   Please contact us before attempting to open the Control Unit.
4. **DO NOT INCREASE THE PRESET MAXIMUM TEMPERATURE.**
   The Control Unit's maximum output temperature is preset at 140° Celsius. Modifying this limit can potentially damage the polyimide heater in the Drying Unit and/or trip the fuse in the Control Unit.

PACKAGE CONTENTS AND INSPECTION

1) IFD-175 EX Filament Dryer
1) Thordsen 3D Decal
2) 6” Velcro® Mounting Straps
1) 12-volt 5A Power Supply
1) Power Cord
1) Length of PTFE (Bowden) Tube

Inspect contents for shipping damage or defects. If your product appears to be damaged, **DO NOT USE IT.** Please report any damage to Thordsen 3D Tech Support at 530-748-2284 or email us at thordsen3d@gmail.com.

(Minor marring or surface irregularities in the molded case is not considered a defect)

VIDEOS

To watch all the latest videos about the IFD-175 EX, visit our VIDEOS page at:

https://thordsen3d.com/videos/

CONTROL UNIT SETUP

The Control Unit has no internal moving parts. You can put it flat on a table or mount it to anything that works best for your application. **Be sure not to block the rear vents.**

Example:
3D printed bracket mounted to control box and attached to enclosure.

DRYING UNIT SETUP

The Drying Unit can be mounted to your printer in any position or angle. Filament may pass through the Drying Unit from either direction. Two Velcro® straps are included to provide a basic mounting solution, but it may be necessary to make a custom mount to place the Drying Unit in the best position on your printer.

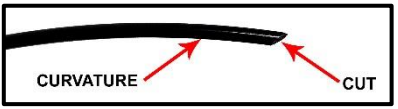
Position the Drying Unit ahead of the feeder so the filament is **PULLED** through it. (*This will allow higher drying temperatures and reduce the risk of clogging.)*

Position the Drying Unit as close to the feeder as possible. *This will reduce the amount of waste needed to pass dried material through the entire system.*

Ensure that there are no pinch points or kinks in the filament path. *Excess drag can cause the material moving through the Drying Unit to stretch. This could result in the filament under extruding at the hot end or not allowing the feeder to grip the filament.*

FILAMENT PREPARATION

Cut the tip of your filament at a 45° angle with the leading edge at the top of the materials curvature. *(This will reduce the risk of snagging when loading the Drying Unit)*



See the "Tips and Tricks" section for more suggestions.

CHARGING THE DESICCANT

The desiccant within the Drying Unit is a silica gel that changes color to indicate its condition. The desiccant does not need to be fully dry to be effective. Its main function is to draw moisture away from the filament after the internal heat source has released it as water vapor.

A bright blue color indicates that it is fully charged (dry) and a pale purple color indicates that it is has fully absorbed moisture (wet). *Examples:*

WET

DRY

Note: The SV (set temperature) is factory pre-set at 140° C for initial charging.

Slow Charging:

The internal heat source not only releases moisture from the filament, but also slowly dries the desiccant while your printer is running. If you run your printer a lot, it's likely that the dessicant will always be dry enough to be effective.

Fast Charging:

If your system is unused for long periods or you are in an evironment with high humidity, it may be necessary to dry the system more often. Turn the system on and allow the desiccant to dry for at least one hour at the maximum of 140° C before running a print job. To do a full drying, let it run until the desiccant is bright blue.

CONTROL PANEL OVERVIEW

❶ **PV Display:**
Displays current temperature.

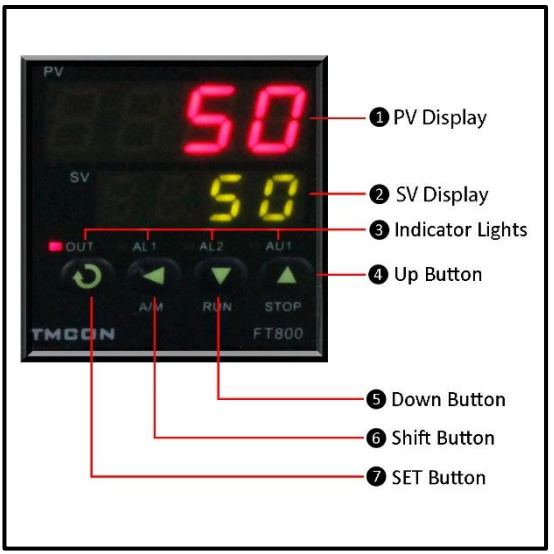
❷ **SV Display:**
Displays user set temperature.

❸ **Indicator Lights:**
OUT: Indicates outgoing current.
AL1, AL2, AU1: Alarms (not used)

❹ **Up Button:**
Increase temperature.

❺ **Down Button:**
Decrease temperature.

❻ **Shift Button:**
Use to move a decimal point



❼ **SET Button:** Locks settings in memory and saves when dryer is turned off.

TEMPERATURE SETTINGS

Press the **UP** ❹ or **DOWN** ❺ buttons to reach the desired temperature. The SV display ❷ will indicate the set temperature and the PV display ❶ will indicate the current temperature of Drying Unit.

BASELINE DRYING TEMPERATURES

The examples below are good starting points for some of the most popular types of filaments. They were tested under normal conditions at our facility and will likely vary based on material brand and environmental conditions in your area.

MATERIAL	DRYER TEMP
ABS	75-90
ASA	80-100
NYLON	70-80
NYLON-CF	70-80
NYLON-GF	70-80
NYLON X	100-110
PC	110-120

MATERIAL	DRYER TEMP
PETG	60-75
PC-ASA	100-110
PVA	50-60
PLA	40-50
PP	60-70
TPU/TPE	40-50
WOOD	30-40

FINE TUNING TO YOUR DRYER

Every filament has a different reaction to heat and humidity. Moisture levels can quickly change depending on environmental conditions and the material being printed. Eliminating moisture (or at least maintaining its consistency) throughout an entire print job is essential. Thordsen 3D has developed a very effective solution for finding the optimal drying temperature for most filaments and environments.

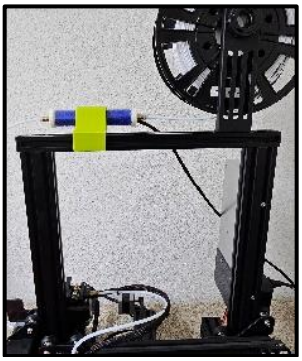
1. Find the TG (glass transition) temperature of your filament. This may be listed on the filament spool or in the technical specifications on the manufacturer's website. *(NOTE: TG is the temperature where filament begins to get soft).*
2. Set the IFD-175 EX to 10° below the TG temperature and let it warm up.
3. Cut a 12" piece of filament and place it into the Drying Unit with material exposed on each end. *(The filament will come to temperature within two seconds)*
4. Grab both ends of the filament and lightly tug in opposite directions. *(If the filament stretches, reduce the drying temperature by another 10° and restart at item 3. If the filament does not stretch, move on to item 5.)*
5. Increase the temperature by 2° and wait about 30 seconds for the system to acclimate. Tug on the filament again. Repeat until you feel it start to stretch. *(This temperature represents the actual TG of the filament in your environment)*
6. Set the Control 5° below your new TG. This is your new set temperature.
7. If you wish to be more precise, run a test print and adjust the settings further as it's running to find the optimal drying temperature.

TIPS AND TRICKS

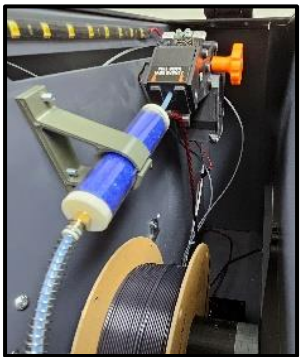
OPTIMIZE DRYING UNIT POSITION

Finding the best position for the Drying Unit will save time and material. As explained in Drying Unit Setup, it can be placed anywhere provided it is ahead of the printer's feeder. *Examples:*

PULSE XE



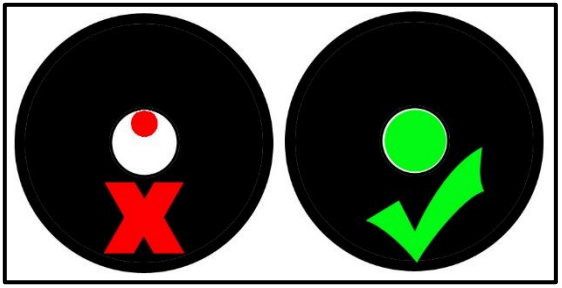
CREALITY ENDER 3



FUSION 3 410

BALANCE THE FILAMENT SPOOL

There is a lot of drag that can be eliminated by balancing the filament spool. The feeder works harder to pull filament through the Drying Unit if the spool is resting on a typical rod or base. Use or make a holder that matches the diameter of the core as close as possible.



TEST PRINT TIPS

- "Patience is a virtue". It may take a little time to find the perfect set temperature, but it is worth it. Especially if you're going to run a long print job.
- Changes in the test print will not be immediate. The dried filament will take time to pass through to the hot end.
- Design the test to run in vase mode or single perimeter wall to make it easy to see the changes. *(A square or rectangle gives the best results)*
- Make it tall enough to be able change the temperature setting several times per print.
- Between each temperature change, put an ink mark on the filament before it passes through the Drying Unit. You will see the mark in the test print, so you know where the change took place.
- If you see under extrusion, decrease the temperature in 1° increments until it stops. If it prints normally, you could raise the temperature in 1° increments to dial it in closer.
- Once the optimal temperature is found, keep a log for each filament. Include the IFD-175 EX temperature, room temperature, and room humidity.

TROUBLE SHOOTING

BELOW ARE THE MOST COMMON ISSUES WITH THE IFD-175 EX. CONTACT TECHNICAL SUPPORT BEFORE ATTEMPTING ANY REPAIR.

PROBLEM	SOLUTIONS
Control Unit will not power up.	Check all power connections and that the AC/DC power brick is on (blue light). Contact technical support.
Filament hangs up while loading through the dryer.	1: Check to make sure that the bowden tube ends are not crushed, cut tube with a sharp knife rather than with wire cutters. 2: Be sure that the bowden tubes are inserted all the way into the connectors. 3: Cut filament at an angle to allow it to pass over mismatched connections. Contact technical support.
Control Unit power cycles off and on.	1: The ceramic heater has a short. 2: Turn unit off immediately. Contact technical support.
PV temperature increases to 1381° and then displays error code **"oRal"**	1: Thermocouple connectors on PID are loose. 2: Thermocouple wires are connected to PID backwards. 3: Thermocouple has burned out. Contact technical support.
Heater does not warm up.	Contact technical support.

Contact Thordsen 3D at 530-748-2284 or email us at thordsen3d@gmail.com.

TERMS AND CONDITIONS

30-DAY SATISFACTION GUARANTEE

We are so confident in our Inline Filament Drying products that we offer a thirty (30) day unconditional satisfaction guarantee. If you are not completely satisfied with an item that you have purchased, you may return it within 30 days from the delivery date for a full refund of the purchase price (minus the shipping and handling). The item must be returned, in good condition, with the original packaging, paperwork, and accessories to ensure full credit.

Limited Manufacturer's Warranty

Thordsen 3D guarantees its products against all defects in manufacturing and parts for a period of one (1) year from date of purchase. The warranty does not cover damage caused by normal wear and tear, accidents, or misuse of our products. Altering or remaking the product in any way, electronically or mechanically, will void the warranty. If your product was purchased from an authorized third-party dealer or distributor, contact us directly for warranty issues. Thordsen 3D is not responsible for products sold by unauthorized third parties or counterfeiters.

Defective Products

If a product is suspected of being defective, please contact us immediately before returning. Thordsen 3D will repair or replace defective items at no charge. The option to repair or replace is at the sole discretion of Thordsen 3D.
DAMAGED PRODUCTS MUST BE RETURNED FOR EXAMINATION BEFORE A REPLACEMENT WILL BE SHIPPED.

NOTES