

12V In-Line 3D Filament Dryer User manual

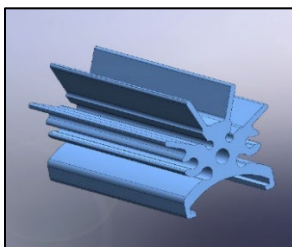
Introduction

This filament dryer is designed to work with FDM/FFF 3D printers. It is an in-line device; it will remove moisture from the filament in real time, before the consumable reaches and passes through the extruder. The device can feed moisture free 3D print filament to one or two extruders simultaneously. It is compatible with Ø1.75mm and Ø2.85mm filament.

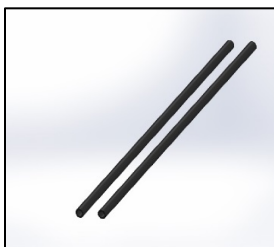
General safety information

- Before using this product read and understand the safety measures.
- Use the product for intended purpose only.
- Use the product with caution. The heating element of the product can generate high temperatures ($\geq 100^{\circ}\text{C}$). Do not dismantle the product. Allow 15 minutes for product to cool down before performing any maintenance or setup modifications.
- Do not modify or change any parts of the product unless the change or modification is authorized by JMS.
- Follow standard electrical safety procedures.
- Install the product near (or on to) the 3D printer in a secure manner. When the device is connected to the 3D printer through filament, the extruder's gear may move or misalign the device.
- The product removes moisture from third party materials. Please follow the safety procedures of the manufacturers of such materials.
- The product operates in conjunction with third-party 3D printers. Please follow the manufacturers' safety procedures.
- Third party materials may release volatile organic compounds (VOCs) and/ or ultrafine particles (UFPs). It is recommended that the product is set up in a well-ventilated area.

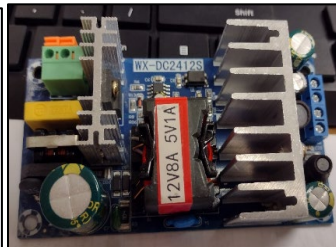
Main Components



Heating Element



Carbon fiber tubes



Power Supply



Temperature Controller

The content of the box:

- 12V/7W heating element (color: blue)
- 12V electronic temperature controller

- (2x) Ø3mm x 110mm carbon fiber tube
- (1x) generic 3D printed console
- 2ft 20AWG wire red
- 2ft 20AWG wire black
- 12V/8A switching power supply - optional
- 4 screws #4x1/4 Type B (for power supply) – optional
- 2 M3x5 screws (for 115V connector) - optional
- 115V cord and connector – optional
- Power switch - optional
- Quick start guide
- Flat blade screwdriver

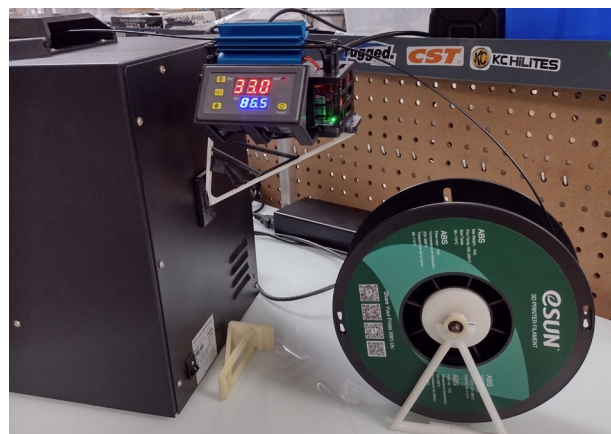
Specifications

- Power consumption: 7W
- Power input/output: 115 – 240 V/12V 8A
- Current draw: 0.58A
- Temperature controller range: -50°C to 120°C
- Max temperature in filament channels: 95°C @ 12.25V

This version is intended (but not limited to) for enclosed 3D printers, older models, with difficult access to extruder, or those machines which would require some modifications to fit the device. Again, you might need to relocate the filament spool. Example below:



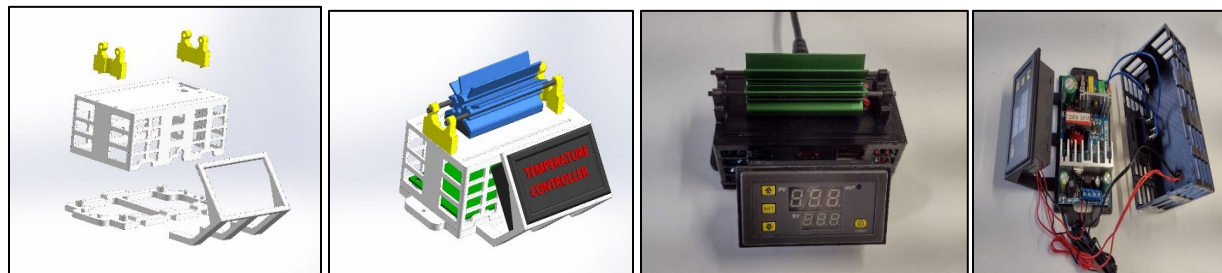
Original spool location



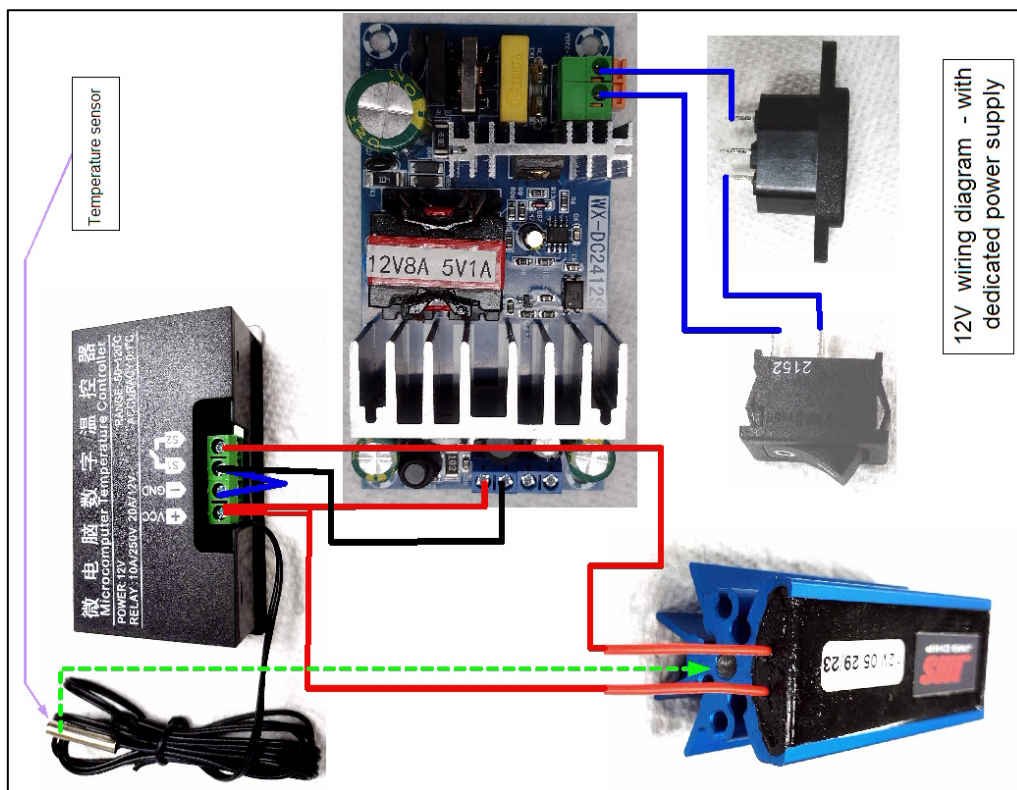
Device installed and spool relocated

The CAD files for the parts needed to assemble the filament dryer's stand/power supply housing can be downloaded from JMS website (STEP/STL format). If you prefer to use your own 12V

power supply, you can opt to purchase only the dryer element, temperature controller, carbon fiber sticks and generic console.



Wiring and connecting the device



Insert the temperature sensor into the middle channel of the heating element, making sure the tip is about half way in; secure the sensor's position with a drop of superglue or silicone. Once you have positioned the heater with the carbon fiber rods and console, apply a drop of superglue or silicone to secure the assembly in place.

Note 1: Should the temperature controller fail, for safety reasons, the device is designed to reach no more than 110 - 112°C in ambient temperature up to 30°C. Therefore, the worst-case scenario can be a failed print.

Note 2: Observe the correct polarity for the temperature controller – it has no protection to reversed polarity.

Note 3: The power supply has 2 outputs: 12V (DC1) and 5V (DC2). The device will not work properly at 5V.

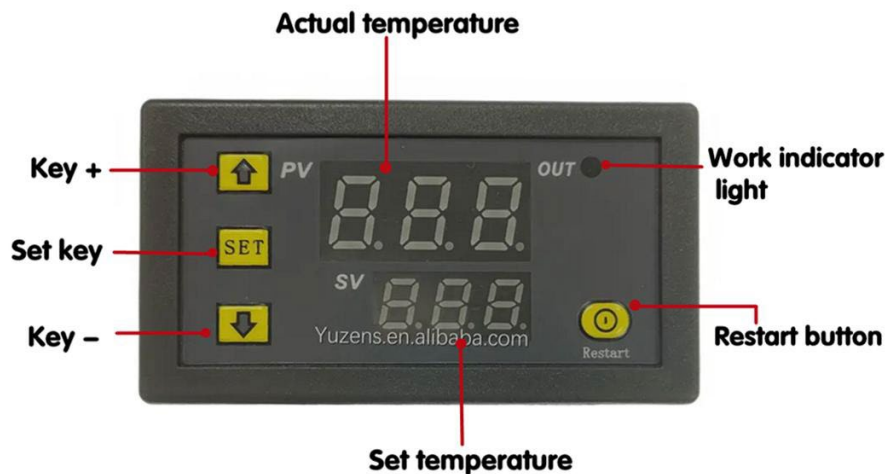
The power supply's 12V terminal block is shown below:



Note 4: If higher drying temperature is needed (i.e., for printing nylon or PC), you can use a PS with 12.5 - 13.5V. Alternatively, you can wrap up the heating element using aluminum foil or download and print the shroud from the website. **Using a power supply with higher voltage may cause the heating element to burn through potting and fail.**

Setting the device's working temperature

The temperature controller comes set for heating at 30°C. Below is a quick start guide. For full controller features, refer to the document “**W3230 manual.pdf**” on JMS website. We recommend reading the controller instructions in full before attempting to customize settings.



Parameter settings codes



P0 Cooling/Heating

P1 Hysteresis setting 0.1-30°C

P2 Maximum temperature setting - upper limit 120°C

P3 Lowest temperature limit -55°C

P4 temperature correction

P5 Delay start time (Unit: minutes) 0-10min

P6 Alarm temperature setting -55°C~120°C

P7 Data locking function ON/OFF

P8 Restore factory settings

Press and hold **SET** for 5 seconds to enter the main menu settings. Press +/- to switch between P0 to P6. Press and hold **SET** for 10 seconds or the controller will automatically confirm and return without any button action.

P0: Cooling and heating modes:

Press and hold **SET** for 5 seconds to display P0. Press and hold **SET** once to set the working mode. Press +/- to switch between [H for heating mode] and [C for cooling mode]. Press and hold **SET** once to return. Press and hold **SET** for 10 seconds or the controller will automatically confirm and save the choice.

P1: Hysteresis setting:

Press and hold **SET** for 5 seconds to display P0, press +/- to switch to P1, press **SET** once to set the return difference, press +/- to set the return difference to 0.1-15, and then press **SET** once to return. Press and hold **SET** for 10 seconds or the controller will automatically save the action.

P2: Set safe temperature limit

Used to set a temperature limit; for example, you are printing ABS and you know that the glass transition temperature of your material is about 90 – 95C. Although the controller's upper temperature limit is 120°C, you can limit the maximum working temperature to, in this case, to 90C. This way, the risk of accidentally setting a higher temp is eliminated.

P7 Save settings

To save the settings, set **P7** to ON when the temperature is set and the power is on. The last settings will be saved when unit is powered off.

P8: Restore factory settings

This function is used to restore the factory settings. Press and hold the + and - buttons in the shutdown state, and then turn on the controller. All the above parameters are restored to the factory settings. The **Restart** key acts also as On/Off switch.

How to set the desired temperature

With the controller powered up, press and hold the **SET** button until the SV (set value) screen starts flashing, then release; using up and down keys, set the desired temperature. The controller will save the set value.



Suggested temperature guide for various 3D print consumables

Filament	Temperature °C
ABS	75-90
ASA	75-90
CF-NYLON	90-100
NYLON	80-95
PETG	60-75

Filament	Temperature °C
PLA	40-50
PC	130-140
PC-ASA	100-120
PVA	50-60
TPU/TPE	40-50

Before starting the first print job, insert a piece of filament into the device, then gradually raise the temperature. Use tables above as starting point. When the material becomes soft or loses its original shape, lower the temperature of the drying device. Remember, the temperature inside the filament channels is typically 3 - 4°C lower than the controller's reading.