

# *noztek Xcalibur*

## USER MANUAL



## Introduction

Introducing the Noztek Xcalibur Extruder: Unleashing Advanced Desktop Extrusion. The Noztek Xcalibur extruder stands as a pinnacle in the world of desktop extrusion technology. It boasts a remarkable array of features, including its 3 high-temperature heater bands, meticulously engineered to perform consistently at temperatures of up to 600°C. The Xcalibur is purpose-built to excel in melting a wide range of materials, encompassing not only traditional polymers but also high-temperature thermoplastics and innovative metal-polymer combinations.

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# Noztek Xcalibur extruder Manual

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## Warranty

We guarantee outstanding quality for our products and services.

Customers who purchase Noztek-manufactured equipment for professional use are guaranteed that they will be free from defects in workmanship and materials for 1 year from date of shipment. If your machine is found to be faulty, we will repair or replace the machine. The warranty and functional guarantee does not cover damages caused by wear and tear or improper use.

**TO INSURE THAT YOUR WARRANTY IS HELD IN EFFECT, PROPER OPERATION PROCEDURES MUST BE OBSERVED.**

**NOTE: READ THE SAFETY PRECAUTIONS BEFORE OPERATING THIS MACHINE.**

For a full breakdown please read our Limitations of Warranty Cover below.

### **Limitations of Warranty Cover:**

- You must own the machine
- The original invoice is decisive as this is your warranty claim (please keep a copy of this)
- Repair or replacement of machine will be determined by Noztek
- Warranty only covers manufacturing or material defects

### **Warranty does not cover:**

- Incorrect use of machine /damage due to misuse
- Damage from force or fall
- Foreign objects inside of machine
- Water damage or dirt
- User failing to follow proper usage instructions
- Normal wear and tear in machine's lifespan
- Unauthorized repairs by consumer

While we stand by the quality of our products, it's important to note that our liability is limited. This warranty represents your sole remedy, and there are no other expressed or implied warranties.

In the rare instance of a covered defect, we offer remedies such as repair or replacement after assessing the reported fault.

Noztek have the right to reject any warranty claim if we feel the request falls outside of our limitations

### **Filing a Claim:**

Need assistance? Our customer support team is ready to help. Refer to the contact information provided in this manual to start the claims process.

## Safety

### **Caution: Injury Risk**

This equipment contains moving parts. To prevent injury, keep hands, fingers, and other body parts clear during operation. Avoid wearing loose clothing or jewellery that may become entangled in moving components. Tie back long hair and secure loose items before using the equipment. Always follow safety instructions provided in the user manual.

### **Caution: Hot Surface**

This equipment can reach high temperatures during operation. Avoid direct contact with exposed surfaces to prevent the risk of burns. Allow the equipment to cool before handling or performing maintenance. Exercise caution and keep out of reach of children. Follow all safety guidelines provided in the user manual.

### **Caution: High Voltage Zone**

This equipment contains high-voltage components. To avoid the risk of electrical shock:

Do not use liquids near the machine: Keep all liquids, including water, away from the equipment. Liquids can conduct electricity and increase the risk of electrical shock.

Do not modify internal wiring: Modifying internal wiring or electronic components poses a serious hazard. Only authorized personnel should perform any maintenance or modifications.

### **Caution: Material guidelines**

Ensure familiarity with the material being extruded, including melting temperatures and ventilation requirements of the space. Failure to do so may lead to damage to the machine and pose health risks to the consumer

## Safety guidelines

- Before operating, ensure you have a thorough understanding of the equipment. Carefully review the provided instruction manual for complete guidance.
- Understand the proper, safe usage and limitations of the equipment.
- Never use this equipment for any purpose other than its intended use.
- Do not modify the equipment in any way.
- Do not make adjustments or perform maintenance while the system is in operation or energized.
- Non-Flammable Cleaning: Refrain from cleaning the equipment with flammable solvents.
- Extruder Vent Precautions:  
Avoid probing into the barrel pallet feed section while the machine is running. Never use a metal probe in the barrel pallet feed section; a wooden probe is recommended.
- Personal Protective Gear:  
Wear a face shield and heat insulated gloves while operating or being near the extruder during operation. These protective items are also necessary when adjusting the die or cleaning the screw. The extruder temperatures are extremely high, and not using protective gear may lead to serious injury.
- Hopper Installation:  
The feed hopper must be installed on the extruder feed section at all times when in operation.
- Material Removal Safety:  
Never put your hands into the feed section or vent to remove material.
- Motor Activation:  
Only switch on the motor when the recommended temperature has been reached.

# Product Specification Sheet

## 1. Product Information:

- Product Name/Model: Noztek Xcalibur Version 3
- Brand/Manufacturer: Noztek
- Serial Number: See invoice
- Date of Manufacture: 2023

## 2. General Description:

• Introducing the Noztek Xcalibur Extruder: Unleashing Advanced Desktop Extrusion. The Noztek Xcalibur extruder stands as a pinnacle in the world of desktop extrusion technology. It boasts a remarkable array of features, including its 3 high-temperature heater bands, meticulously engineered to perform consistently at temperatures of up to 600°C. The Xcalibur is purpose-built to excel in melting a wide range of materials, encompassing not only traditional polymers but also high-temperature thermoplastics and innovative metal-polymer combinations.

**Elevate your extrusion experience with the Noztek Xcalibur Extruder.**

## 3. Technical Specifications:

- Voltage Requirements: 220VC or 110VC
- Power Rating: 10A
- Frequency (Hz): 50 Hz or 60 Hz.
- Operating Temperature Range: -40°C to 85°C (-40°F to 185°F)
- Dimensions (including weight and size): 112cm x 18cm x 54cm. 32 KG.
- Material Composition: Steel or stainless steel.
- Color/Finish: Black powder coat or brush stainless steel.
- Motor: 33RPM 24VDC 37.8 NM or 57RPM 24VDC Motor 35NM

## 4. Key Features:

### Program Memory:

The system retains the most recently used target temperature, speed settings, and timer configurations even after a system restart.

### Noztek controller:

The Xcalibur comes complete with Noztek's proprietary integrated software, seamlessly connecting to a computer to provide real-time performance monitoring, complete with detailed temperature and speed charts.

### Warm-Up Function:

The warm-up feature is engineered to ensure the barrel reaches optimal

operating temperature within 10 minutes. This minimizes the risk of unmelted materials obstructing the motor, thereby preventing potential damage to the motor or the machine.

**Emergency Shutdown Capability:**

In cases of urgency, the system offers a rapid electrical shutdown mechanism for immediate cessation of all operations.

**Motor Block Management:**

Should the motor face any operational hindrance, the system promptly issues a notification message and halts the motor to prevent further complications.

**Sensor Anomaly Detection:**

The system incorporates sensor malfunction detection, which promptly communicates deviations from correct temperature readings by issuing a notification message.

**7-Inch TFT Touchscreen Control Panel:**

The machine features a sophisticated 7-inch Thin-Film Transistor (TFT) touchscreen, providing an intuitive and responsive interface for operating and configuring the equipment.

**5. Safety Information:**

- Warnings: See safety sheet
- Recommended Safety Gear: See safety sheet
- Emergency Shutdown Procedures:

In the event of an emergency, firmly press the red emergency button located at the front of the machine. This action will swiftly deactivate the power supply, bringing all ongoing processes to an immediate halt.

**6. Operating Instructions:**

- Step-by-step instructions for safe and proper use of the product: See safety sheet and guide
- Start-up and Shutdown Procedures: See guide
- Control Panel Layout: See guide
- Maintenance and Cleaning Guidelines: See maintenance sheet.

**7. Technical Diagrams:**

- Available upon request.



## **8. Performance Data:**

### • Heater bands:

Equipped with three distinct, independently controlled heater bands, each capable of reaching temperatures up to 600°C. (On request, an upgrade to 750°C is available).

### • Optional Quick-Release Heater Bands:

For convenient and frequent cleaning requirements, we offer the option of quick-release heater bands upon request.

### • Noztek's Proprietary Stainless Steel Screw:

The Xcalibur features a proprietary stainless steel screw meticulously designed, developed, and manufactured by Noztek. Its primary function revolves around the generation of substantial barrel pressure, ensuring the extrusion process yields a uniform and flawless filament. The screw's specifications are as follows:

- Length: 400mm
- Three-Stage Gradient Slope: 130-200mm
- Channel Depth: 5mm
- Pitch: 23 degrees

These design parameters collectively contribute to the screw's exceptional performance and the production of high-quality filament.

### • Motor speed:

The Xcalibur provides the flexibility to be equipped with a motor operating up to either 33 revolutions per minute (rpm) or 57 rpm.

### • Hopper capacity:

750 gram maximum, 50 gram minimum.

### • Extrusion Output Rate:

The Xcalibur demonstrates an impressive extrusion capacity, capable of producing approximately 6-8 meters of filament per minute. This translates to an estimated output of 360-480 meters or 2 kilograms of filament per hour.

## **9. Accessories and Included Items:**

- Mains cable
- A-B USB cable
- Hopper
- Spare nozzle

## **10. Warranty Information:**

- See warranty sheet.

## **11. Compliance and Certifications:**

- CE

## **12. Technical Support and Contact Information:**

- [info@noztek.com](mailto:info@noztek.com)
- <https://noztek.com/contact/>
- 44 (0) 203 384 6208

• Noztek Head office  
Unit C3 Dolphin Enterprise Centre  
Evershed Way  
Shoreham  
West Sussex  
BN43 6QB  
ENGLAND

## Set-up Instructions

### 1. Unpacking and Placement:

Caution: Do not plug the machine into the mains or turn it on during set-up. Carefully unpack the machine and accessories. Place the machine on an even, stable surface, ensuring there are no flammable materials nearby as the heater bands can reach temperatures of up to 600°C.

### 2. Hopper Attachment:

Begin by attaching the hopper. Locate two bolts in the barrel's designated holes. Unscrew these bolts, position the hopper over the holes, and securely screw the bolts back in place.

### 3. Power Connection:

Once the initial steps are completed, you can plug in the mains cable into the machine. Before doing so, double-check that the mains voltage (e.g., 220VAC or 110VAC) matches the voltage specified on the machine (refer to the sticker on the machine).

Note: Always follow these set-up instructions meticulously to ensure the safe and effective operation of the machine. If you encounter any issues or have questions, refer to the comprehensive user manual for further guidance.

### 4 (Optional) USB Connection:

To utilize this machine with our Noztek controller software, use the provided A-B USB cable. Connect the cable from the back of the machine to your computer. Please note that the controller software is compatible only with Windows machines.

## Operation Instructions

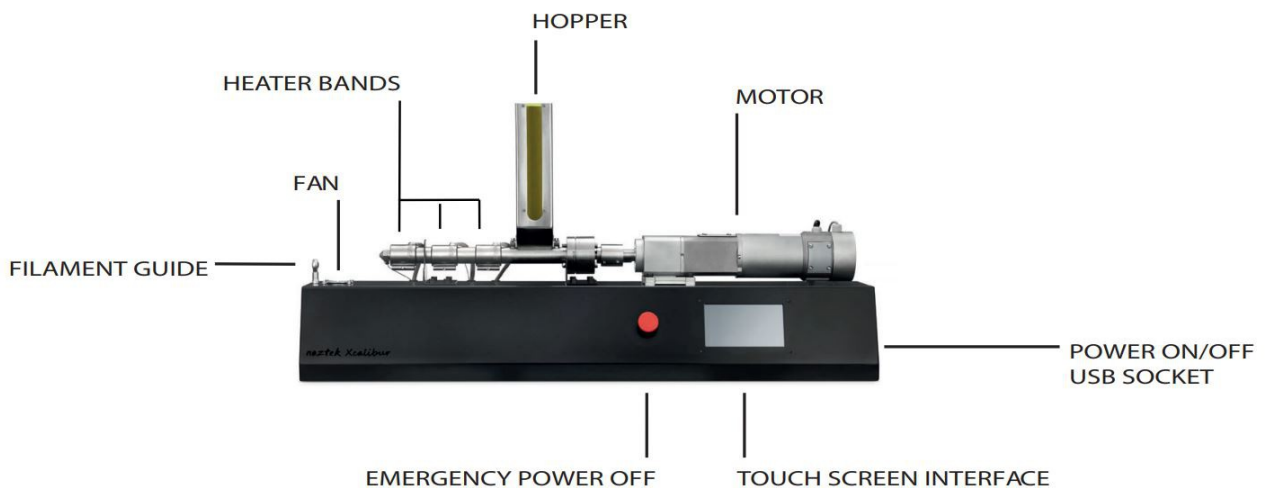
### Important Note:

Ensure that you acquaint yourself with the proper handling guidelines for the material you are using, particularly its melting point. Neglecting to do so may compromise the functionality and potentially damage the equipment.

Please bear in mind that the quality of the extruded filament is influenced by factors beyond just the operation of the machine. Considerations such as room humidity, room temperature, material humidity, and ensuring the correct temperature settings all play crucial roles.

### STEP 1. Familiarization:

Familiarize yourself with the following; TOUCH SCREEN, EMERGENCY POWER SWITCH, MAINS POWER SWITCH.

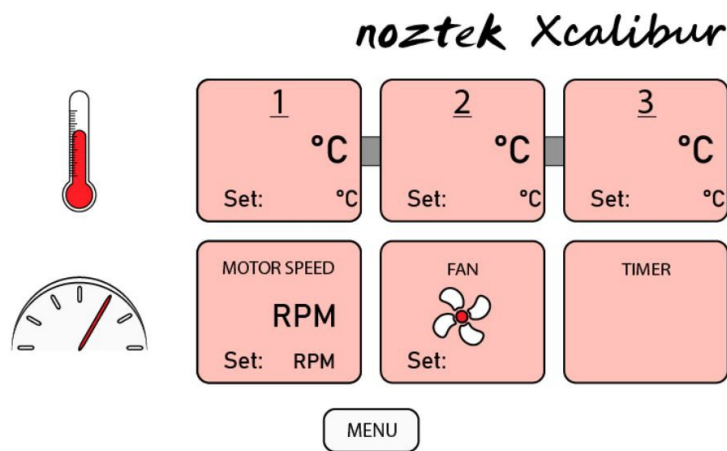


### STEP 2. Start up procedure:

To turn on the machine, use the illuminated MAINS POWER SWITCH located at the back.

### STEP 3. Main Screen Overview:

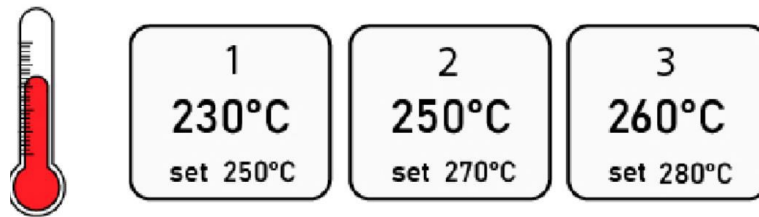
The main screen provides comprehensive information about the actual current temperature in Celsius for individual heating bands and the motor speed in RPM (top row). TEMP 1 corresponds to the main heater band nearest to the nozzle, TEMP 2 corresponds to the middle heater band, while TEMP 3 corresponds to the third heater band. The second row displays the set temperature and motor speed. The third row features activation/status switches, and access to the Menu screen is available at the bottom.



To activate the heating bands, simply touch any of the temperature activation/status switches. Once activated, the Noztek Xcalibur display will transition to the 'warm-up' screen (see image below). The Noztek Xcalibur remains on this screen until the heating bands reach the set temperature or until the user manually aborts the heating process. The motor switch activates only after the warm-up phase, ensuring the motor runs safely thereafter.

### STEP 3.1. Warm-up screen

This screen appears during the initial heating process or when the temperature falls below the target. The warm-up is essential to ensure that the barrel reaches a specific temperature before enabling the motor to run safely

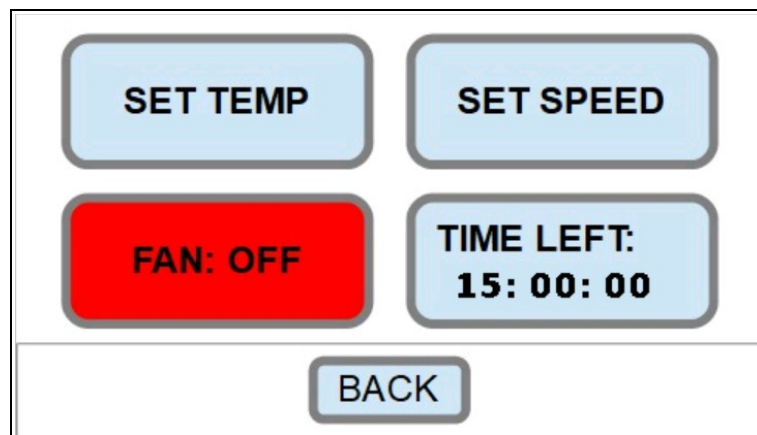


**Time Remaining: 3:25**

BACK

### STEP 3.2. Menu Screen

The Menu screen provides users with access to all of The Noztek Xcalibur settings and additional functionalities, including temperature settings, speed settings, fan settings, and timer settings.



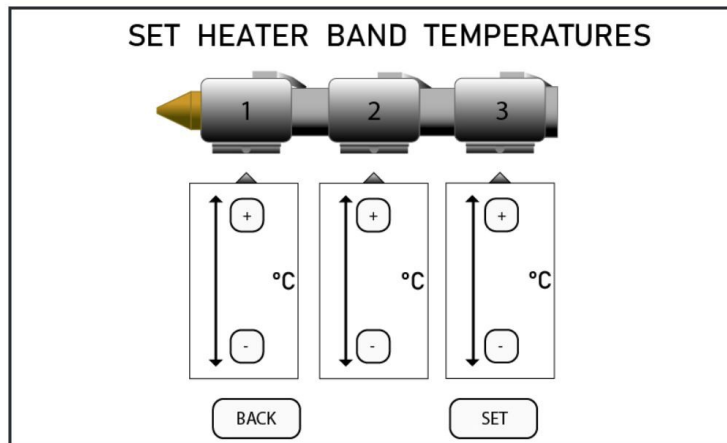
SET TEMP: Adjusts the desired temperature of the individual heating bands.

SET SPEED: Configures the desired revolutions per minute (rpm) for the D.C. motor drive.

FAN: ON/OFF: Activates or deactivates the fan.

TIME LEFT: Sets a timer for automatically shutting down the DC motor drive and heating bands.

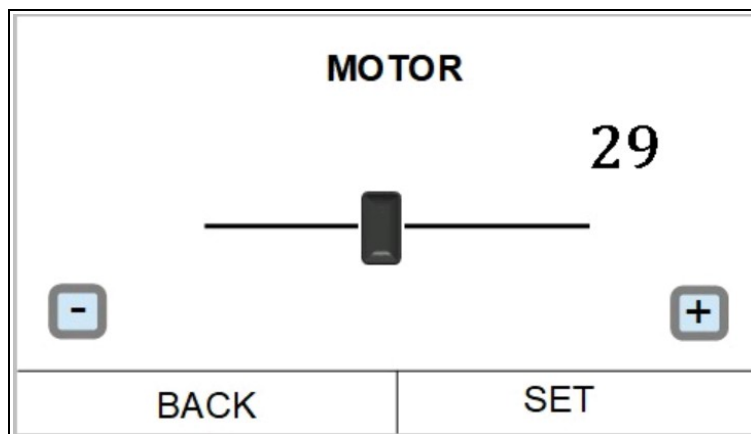
### STEP 3.3. Temperature setting



This screen allows the user to set the temperature for each heating band. Users can achieve this either by using the sliders or the "+" and "-" buttons and then confirming with the "SET" button. To cancel any modifications, press "BACK". The Noztek Xcalibur allows a maximum temperature setting of 600°C for each heater band.

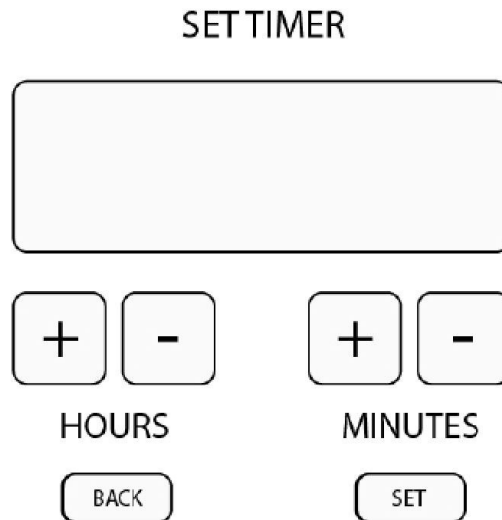
### STEP 3.4. Motor speed setting

This screen allows the user to set the speed for the motor in RPM. Users can achieve this either by using the sliders or the "+" and "-" buttons and then confirming with the "SET" button. To cancel any modifications, press "BACK."



### STEP 3.5. Timer Setting

This screen allows the user to set a timer for shutting down the current session. This action does not power off the Touch but stops both the heating and the motor. Users can set the timer using the "+" and "-" buttons and then confirm with the "SET" button. To cancel any modifications, press "BACK".



### STEP 4. Initiating Extrusion:

Add your pellets and, after the warm-up procedure, initiate the extrusion process by turning on the motor using the motor on/off button. After a short duration, the plastic will emerge from the nozzle. Pull the filament through the guide. The extruded filament will be hot, so use heat-resistant gloves. Some materials may require immediate cooling after extrusion; turn on the fan using the fan on/off button to facilitate this. The operational set-up is now complete.

### STEP 5. Shutdown Procedure:

When finished, turn off the EMERGENCY POWER SWITCH, MAINS POWER SWITCH, These instructions ensure safe and efficient operation of the Noztek Xcalibur.

### Additional Information:

#### Quality Measures:

Extrude approximately 5m of filament, switch off the motor, cut off the excess material, and then restart the motor. This helps eliminate air bubbles and metal particles in the system.

#### Color Mixing:

Adding colors is a straightforward process. Mix the natural and colorant at the given ratio, then pour it into the hopper. It will take 10-20 minutes to observe changes in color.



**Temperature Adjustments:**

Adjusting the temperature also affects filament tolerance. Higher temperatures result in thinner filament, while lower temperatures result in thicker filament. Make adjustments in 5-degree Celsius increments.

**Connecting to a computer:**

The Noztek Controller software empowers you to control the Xcalibur and gather data through a USB connection. Kindly refer to our Controller Software Manual for a more in-depth understanding of the software and detailed instructions.

## Maintenance

**Changing the Nozzle:**

Before attempting this operation, ensure you use heat-insulated gloves. To switch between nozzle sizes, heat the unit to the temperature required to melt the material previously used. Wait for 10 minutes to ensure all material is molten. Unscrew the nozzle using a spanner, clean any excess plastic from the internal threads, and then screw on the new nozzle.

**Maintenance:**

Regular cleaning of your plastic extrusion tooling is crucial for prolonging machine life, reducing waste, and maintaining tighter tolerances for your final product. We recommend running purging agents like polypropylene through the barrel for cleaning. If this is not possible, use a wire brush and fine metal pick to clean the threads and screw assembly. If you are unsure how to clean the barrel, please contact the Noztek helpdesk for assistance.

**Barrel Jam:**

Depending on the resin type, you may occasionally encounter a barrel jam. If the motor starts laboring and slowing down during extrusion, immediately switch off the motor. To free the jam, increase the temperature to approximately 25-50 degrees Celsius above the recommended melting temperature of the material and leave it for 15-20 minutes. Then switch on the motor again; this should allow the screw to rotate, purging the barrel.

## Contact noztek

For more in-depth troubleshooting assistance, we encourage you to explore our FAQ help section on our website at [www.noztek.com](http://www.noztek.com). In the event that your specific query is not addressed within this resource, please do not hesitate to reach out to our dedicated Noztek expert team for direct support and guidance.

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