3D Printer Manual

RAISE3D PRO2 SERIES

www.raise3d.com

CONTENTS

SAFTY

Warning: Indicates a potentially hazardous situation which, if not avoided, may result in injury or damage.

Hot Nozzle: The hot nozzle sign indicates the presence of devices with high temperatures. Always use extra care when working around heated components. Always wear the heat resistant gloves provided in the Starter Box.

Nozzle temperatures in the printer can exceed 300℃(572℉).

Hot Surface: The hot surface sign indicates the presence of devices with high temperatures. Always use extra care when working around heated components. Always wear the heat resistant gloves provided in the Starter Box.

Moving Parts: The moving parts sign indicates that a hazard exists where you touched, it can cause serious bodily injury. Always keeps hands clear of Moving Parts.

High Voltage: The high voltage sign indicates the presence of high voltages. Always stay away from any exposed electrical circuitry. It is recommended that all jewelry be removed.

ELECTROMAGNETIC COMPATIBILITY

● Electromagnetic Compatibility-EMC

● **Simplified EU Declaration of Conformity**

Pro2/Pro2 Plus declares that this device is in compliance with the essential requirements and other relevant provision of Directive 2014/53/EU.Full tex of EU declaration of conformity is available at

https://www.raise3d.com

The WIFI operation in the band 5150-5250MHz shall be restricted to indoor use for countries listed in the table below:

CE Mark Warning

This is a Class B product, in a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

CE

AT	BE	BG	CZ	DK	EE	FR
DE	IS	IE	IT	EL	ES	CY
LV	LI	LT	LU	HU	MT	NL
NO	PL	PT	RO	SI	SK	TR
FI	SE	CH	UK	HR		

Pro2/Pro2 Plus CE Output power table:

Function	Frequency	Maximum Output Power (EIRP)
WiFi	2412-2472 MHz	18.25dBm(b)/ 16.30dBm (g)/ 15.21dBm (HT)
	5150-5250 MHz	15.9 dBm(a)/ 14.71 dBm(HT20)/ 14.28 dBm(HT40)
	5725-5850 MHz	15.9 dBm(a)/ 14.71 dBm(HT20)/ 14.28 dBm(HT40)

FCC Output power table

Function	Frequency	Maximum Output Power
WiFi	2412-2462 MHz	18.31dBm(b)/ 15.62dBm (g)/ 14.9dBm (HT 20)
	5150-5250 MHz	15.36 dBm(a)/ 14.79 dBm(HT20)/ 14.41 dBm(HT40)
	5725-5850 MHz	15.48 dBm(a)/ 14.49 dBm(HT20)/ 14.06 dBm(HT40)

ELECTROMAGNETIC COMPATIBILITY

● **FCC Statement**

This device and its antenna must not be located or operating in conjunction with any other antenna and transmitter.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

RF exposure information: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
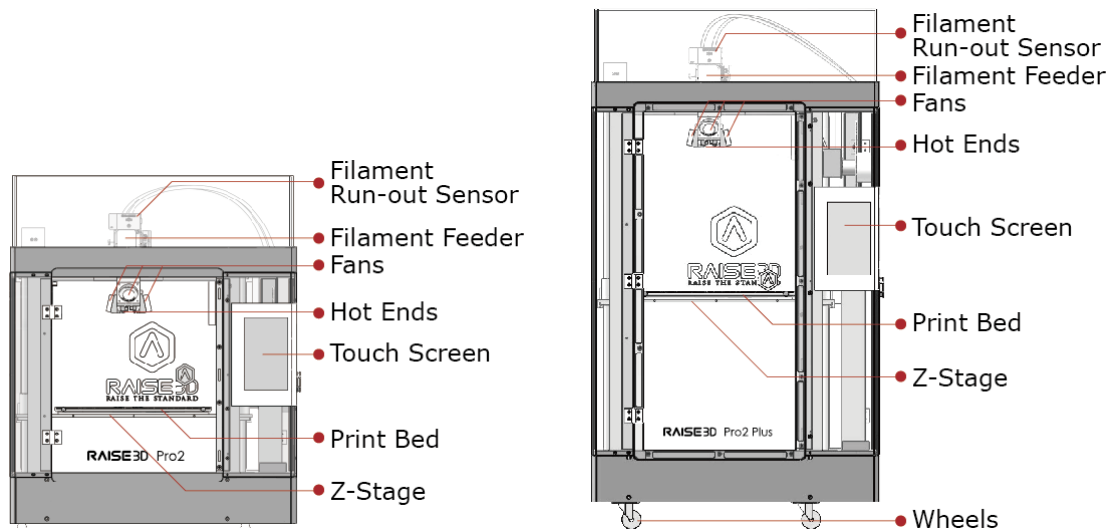
TECHNICAL SPECIFICATIONS

● Technical Specifications – Pro2 / Pro2 Plus

Item		Pro2	Pro2 Plus
Power Supply Input		100-240 VAC, 50/60 Hz 230V@3.3A	
Power Supply Output		24VDC 600W	
User Interface Controller		Freescale imx6, Quad core 1Ghz ARM processor	
Ports		SD card*1, USB 2.0*2, Ethernet*1	
Network	Ethernet	Ethernet 802.11b/g/n	
	WLAN	IEEE802.11b/g:2412MHz to 2472 MHz IEEE802.11n HT20:2412MHz to 2472 MHz IEEE802.11a:5150 - 5250MHz, 5725 -5850 MHz IEEE802.11an HT20:5150 - 5250MHz, 5725 -5850 MHz IEEE802.11an HT :5150 - 5250MHz, 5725 -5850 MHz	
Print Technology		FDM	
Build Volume (W×D×H)		Single Extrusion Print: 12×12×11.8 inch 305×305×300 mm Dual Extrusion Print: 11×12×11.8 inch 280×305×300 mm	Single Extrusion Print: 12×12×23.8 inch 305×305×605 mm Dual Extrusion Print: 11×12×23.5 inch 208×305×605 mm
Machine Size (W×D×H)		24.4×23.2×29.9 inch 620×590×760 mm	24.4×23.2×43.5 inch 620×590×1105 mm
Filament Diameter		0.2/ 0.4/ 0.6/ 0.8mm	
Print Head Travel Speed		30 - 150 mm/s	
Max Build Plate Temperature		110 ºC	
Supported Materials		PLA / ABS / HIPS / PC / TPU / TPE / NYLON / PETG / ASA / PP / Glass Fiber Enforced Carbon Fiber Enforced / Metal Particles Filled / Wood Filled	
Nozzle Diameter		0.2/ 0.4/ 0.6/ 0.8mm	
Max Nozzle Temperature		300 ºC	
Operating Temperature		5-35 ºC	
Storage Temperature		-25°C to +55°C	

COMPONENTS AND PARTS

Printer Components and Parts

1. Front Parts

Filament Run-out Sensor
Filament Feeder
Fans
Hot Ends
Touch Screen
Print Bed
Z-Stage

Filament Run-out Sensor
Filament Feeder
Fans
Hot Ends
Touch Screen
Print Bed
Z-Stage
Wheels

A   Filament Run-out Sensor

That can detect whether filament has been run out.

B   Filament Feeder

That's part includes feeder motor and gear mechanical.

C   Hot Ends

The hotend is made up of Nozzle,heater block, thermocouple, heater cartridge and heat sink. Nozzle

⚠ WARNING

temperatures in the printer can exceed 300℃(572℉).

D   Touch screen

That is human machine interface. All operation commands are from this. Some alarm information can be displayed on the screen.

E   Print bed

Print bed includes buildtak sheet and heat bed.

⚠ WARNING

temperatures in the printer can exceed 110℃.

E   Z-stage

That platform supports the print bed.

2. Rear Parts

COMPONENENTS AND PARTS
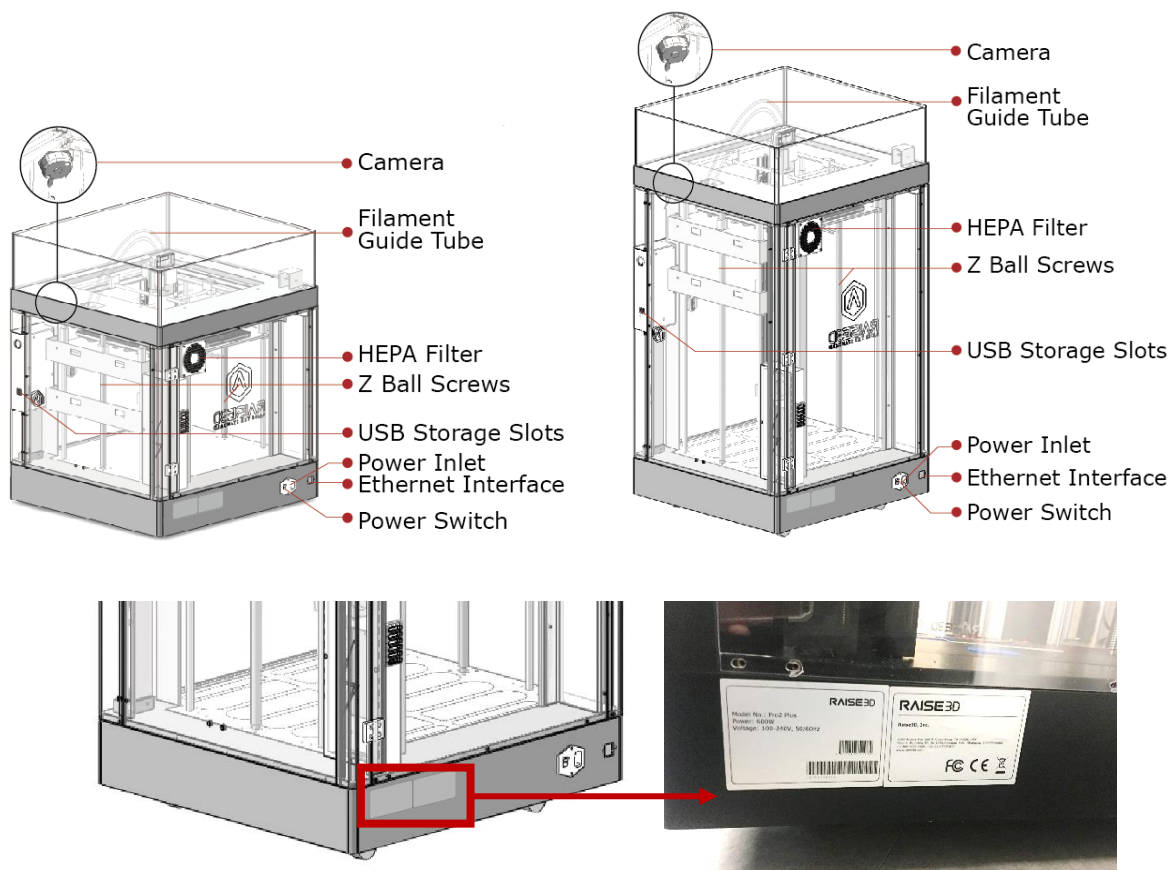
A   Camera

That can monitor the printing process in remote place.

B   Filament guide tube

This tube is perfect for minimizing bending and friction against the filament material.

C   HEPA filter

That is designed to improve air quality on exhaust and deduce smell from filaments.

D   Z ball screws

The parts can drive Z stage's movement.

E   USB storage slots

F   Power inlet and Power switch

That is the power supply unit.

A 250V 10A fuse is located to protect the input power.

3.   Bottom Parts.

Z Motor

Switching Power Supply

Z Driver

Y Driver

X Driver

4. Electrical Parts

X Motor

Y Motor

Motion Control Board

Screen Control Board

Screen
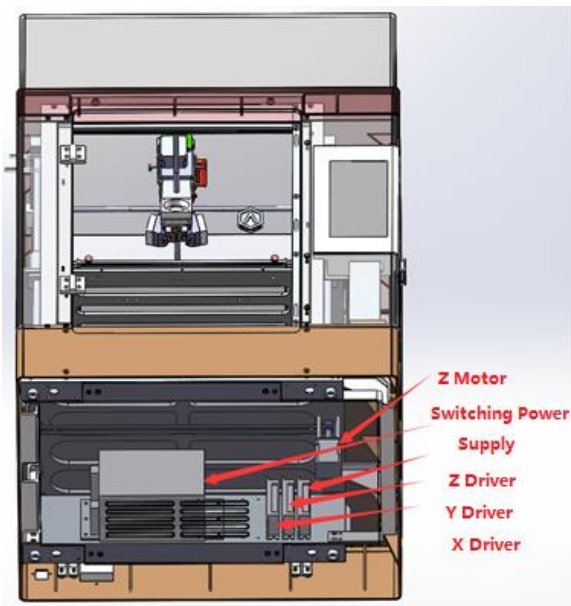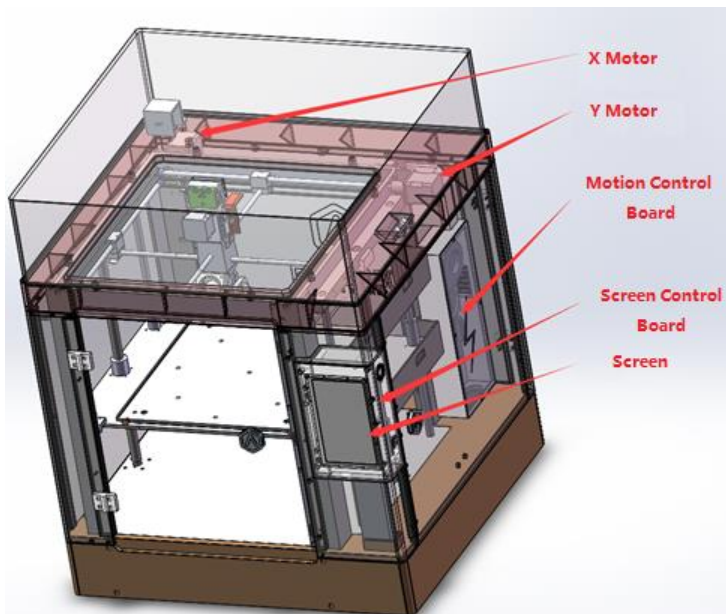
SPARE PARTS

- Spare Parts

Power Cable (×5)	**Hex Wrenches**	**Filament** (×2)	**Build Plate** (with Build Surface inside Protective Cover)
USB Storage	**Heat Resistant Gloves**	**Filament Holder** (×2)	**Spatula**
Nozzle Cleaning Kit	**Tweezers**	**Fuse**	**Thumb Screws** (Spare)
			Other Accessories (Spare)
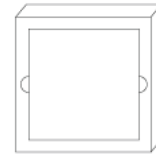
PRECAUTION AND INSTALLATION

●

Read the entire installation section before starting installation.

⚠ WARNING

Connect equipment to a grounded facility power source. Do not defeat or bypass the ground lead.

• Know the location of equipment branch circuit interrupters or circuit breakers and how to turn them

on and off in case of emergency.

• Know the location of fire extinguishers and how to use them. Use only ABC type extinguishers on

electrical fires.

• Know local procedures for first aid and emergency assistance at the customer facility.

• Use adequate lighting at the equipment.

• Maintain the recommended range of temperature and humidity in equipment area.

• Do not use this product in an environment containing volatile or flammable compounds.

● **ENVIRONMENTAL REQUIREMENTS**

• The 380mc and 450mc are for indoor use only.

• Air quality conditions with excessive solid particulates (conductive or

non-conductive) may result in system damage.

• Air quality conditions in which airborne oils are allowed to accumulate on or within the printer

can damage the plastic components.

• Operating temperature shall be in the range of 5°C to 35°C, with relative

humidity range of 30% to 70% non-condensing.

• Storage temperature shall be in the range of -40°C to 55°C, with relative

humidity range of 10% to 85% non-condensing.

• Altitude shall not exceed 6561.68 feet (2000 m).

• Noise emission (acoustic):
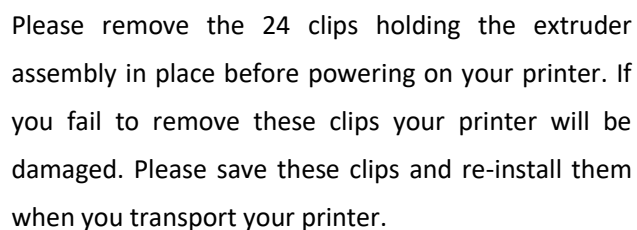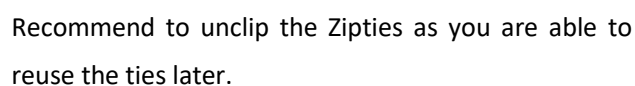
• <50dBA when building

Note: The 380mc and 450mc printers are capable of generating vibrations depending mainly on part build geometry and material characteristics. This consideration will need to be taken into account if locating the printer near vibration sensitive equipment.
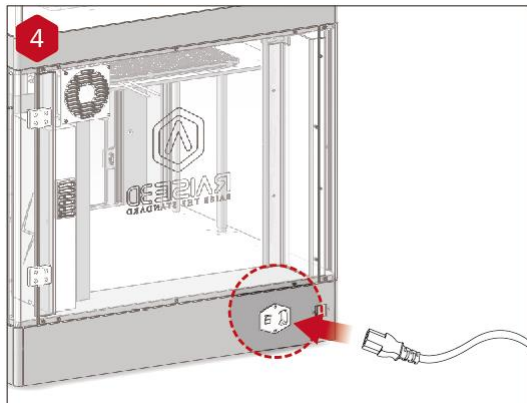

● Input Supply Connection

Installation and mains outlet socket shall be made and protected according to appropriate rules. Check the input voltage, phase, and frequency supplied to this machine before turning it on. Verify the connection of grounding wires from the machine to the input source. The allowable input voltages are 1x(90-240)V 50Hz/60Hz. For more information about input supply refer to the technical specification section of this manual and to the rating plate of

PRECAUTION AND INSTALLATION

the machine. Make sure the amount of power available from the input connection is adequate for normal operation of the machine.

After connecting the input cord to the machine, make the power switch on, the Pro2 / Pro2 Plus printer will start to work.

● Hardware Installation

Recommend to unclip the Zipties as you are able to reuse the ties later.

Please remove the 24 clips holding the extruder assembly in place before powering on your printer. If you fail to remove these clips your printer will be damaged. Please save these clips and re-install them when you transport your printer.

Use the 3mm hex wrench to remove the Z axis clamps on both Z axis ball screws.
The 3mm hex wrench is packed inside the tool box located inside the top foam.

PRECAUTION AND INSTALLATION

Plug the machine into a wall outlet and power on. The power cable is packed inside the tool box located inside the top foam.
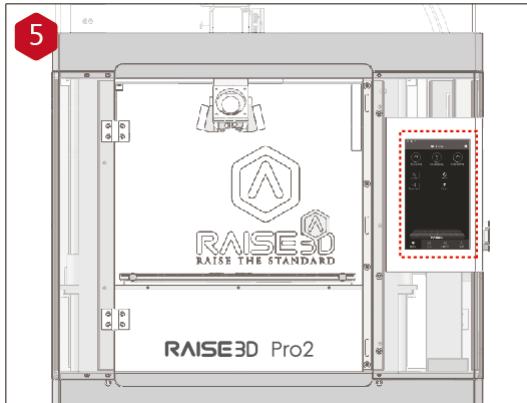
The printer will go through a start-up sequence. When the touch screen displays "Home", the printer is ready.
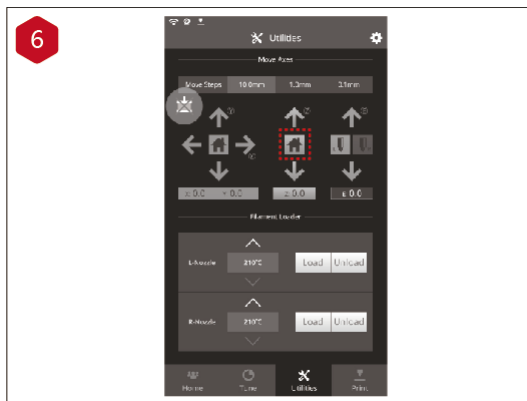
Go to "Utilities" and press Z homing button to home the Z print bed to origin position.
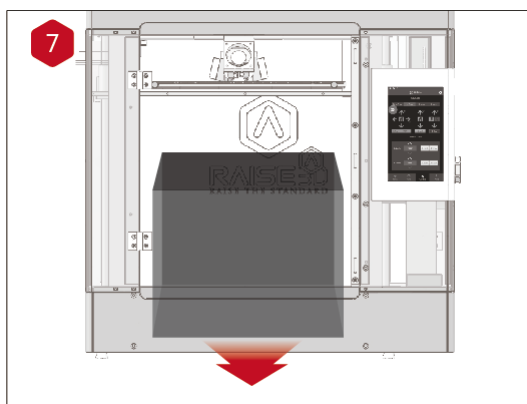
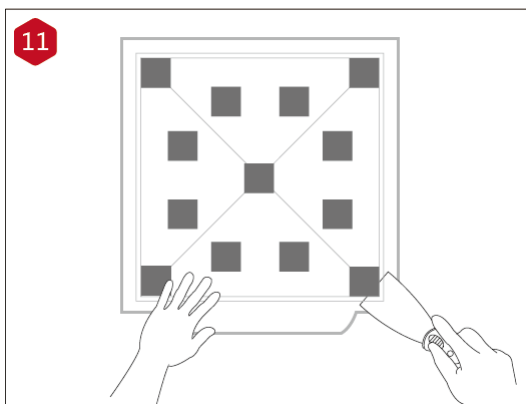Take the starter box and filament box out from the base of the printer. And open for standby.

PRECAUTION AND INSTALLATION
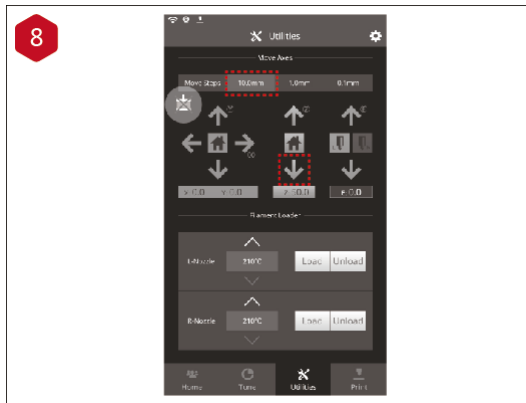
Select "10mm" for "Move Steps" and move Z platform downward   to 50mm.
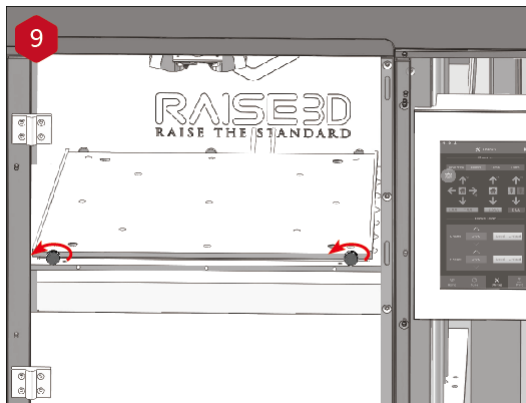
Loose the two thumb screws in front of the build plate with anti-clockwise rotation.
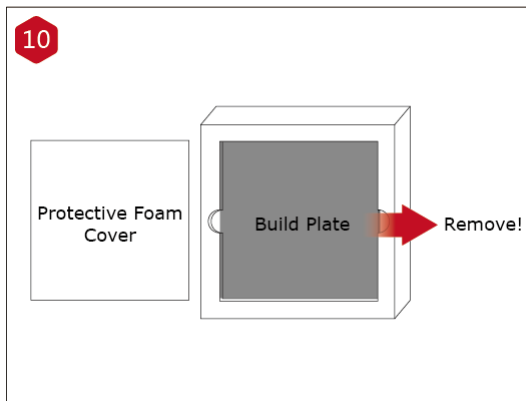
Take build plate off from the protective cover.

Please remove the leveling testing model carefully from the build plate.

12
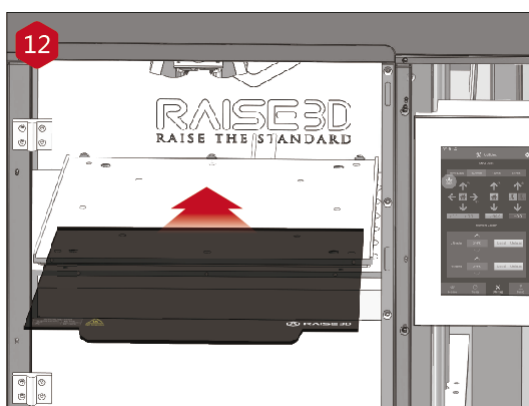
Slide the build plate onto the Z platform. Face the surface with Raise3D logo up.

13
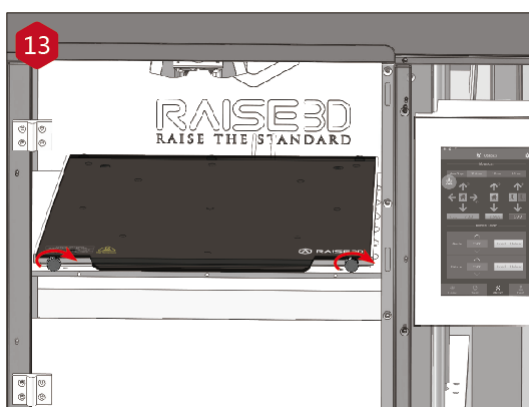
Re-install the thumb screws back with clockwise rotation.

14
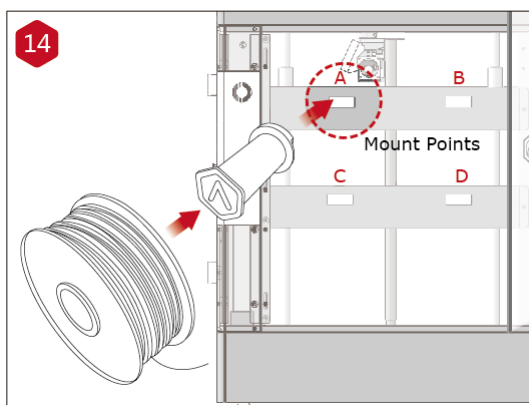
Install the filament holder in the mount point on the side of the printer and place a spool of filament on the holder.
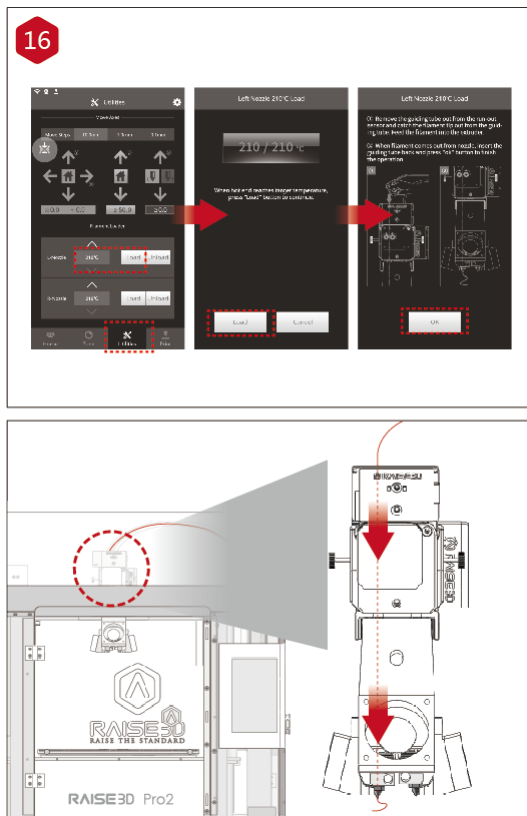
NOTE: The direction of filament spool should be placed to rotate in clockwire at mount points B and D and counterclockwise at mount points A and C.

15
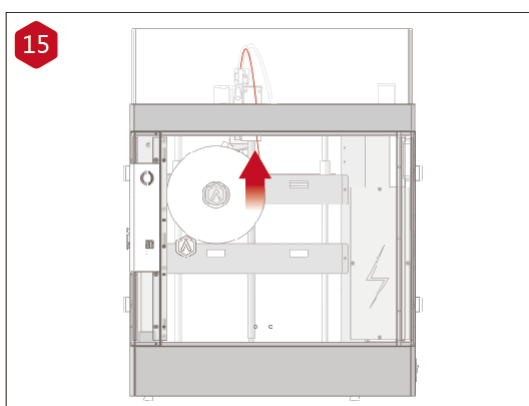
Feed the filament through the guide tube.

Press the "Utilities" menu on the screen and set the temperature of the left nozzle for the filament, then press the "Load" button. Finish the feeding operation step by step according to the instructions on the screen.

NOTE: This document is set based on the Raise3D PLA filament, which is delivered together with the printer. Therefore we advise that you use this PLA for testing.
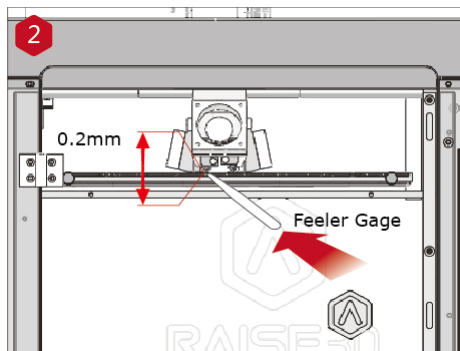
● Operation

Even though Pro2/Pro2 Plus is preleveled in the factory, please press X/Y axis 'home' button first and then Z axis 'home' button to check whether the leveling is changed during shipping.

Select "10mm" for "Move Steps" and move X to 50mm, Y to 10mm.


Please use the feeler gauge to check the distance between nozzle and printing platform. The optimal distance between is 0.2mm.

The best condition of this is that you can feel a little friction when you slide the feeler gauge into the gap.
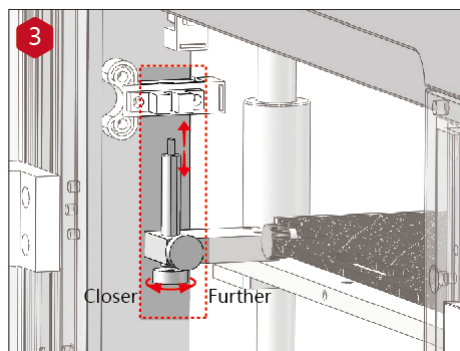

The distance between the nozzle and the printing platform can be adjusted by turning the thumb screw on the left-front corner of the Z-plate, the higher the screw stands out, the further the distance between the nozzle to the printing platform gets.
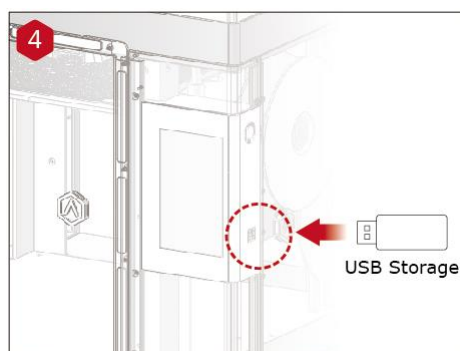
The USB storage included with the printer comes loaded already with sliced models. It is a good place to start for your first print.

Insert the USB storage into the USB slot on the side of touchscreen.
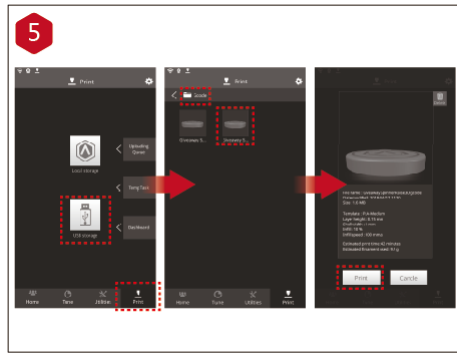
Select "Print" menu, choose "USB Storage" in the file storage path. Select the file to check the printing parameters and settings, then press "Print" to start printing test file.

During printing, you can check status, printing time remaining and other parameters from the touchscreen in the "Home" interface.

NOTE: The image on the touch screen will only be shown when the file is sliced by ideaMaker.

The .data file is saved in USB storage or uploaded to screen.

● WLAN Connection:

You can choose a network to join by inputting the password. When the WIFI module is manufactured, 2.4G is set at HT20, 5GHz is set at HT40. The wifi's frequency is fixed before being manufactured. The customer is not allowed to modified WIFI's parameter. If there's needed, please connect Raise 3D.
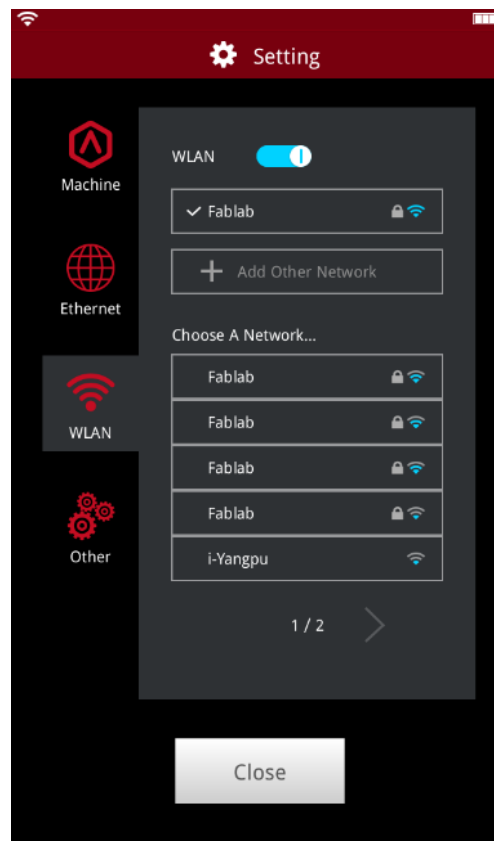
Or **Add Other Network** with inputting its name and password.

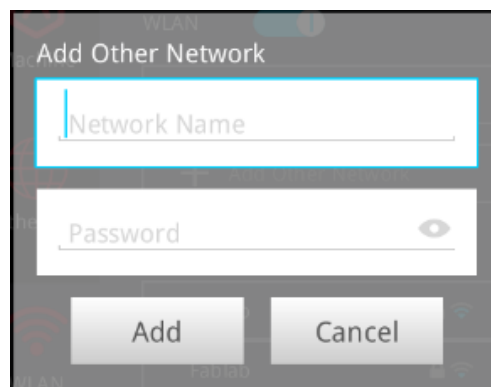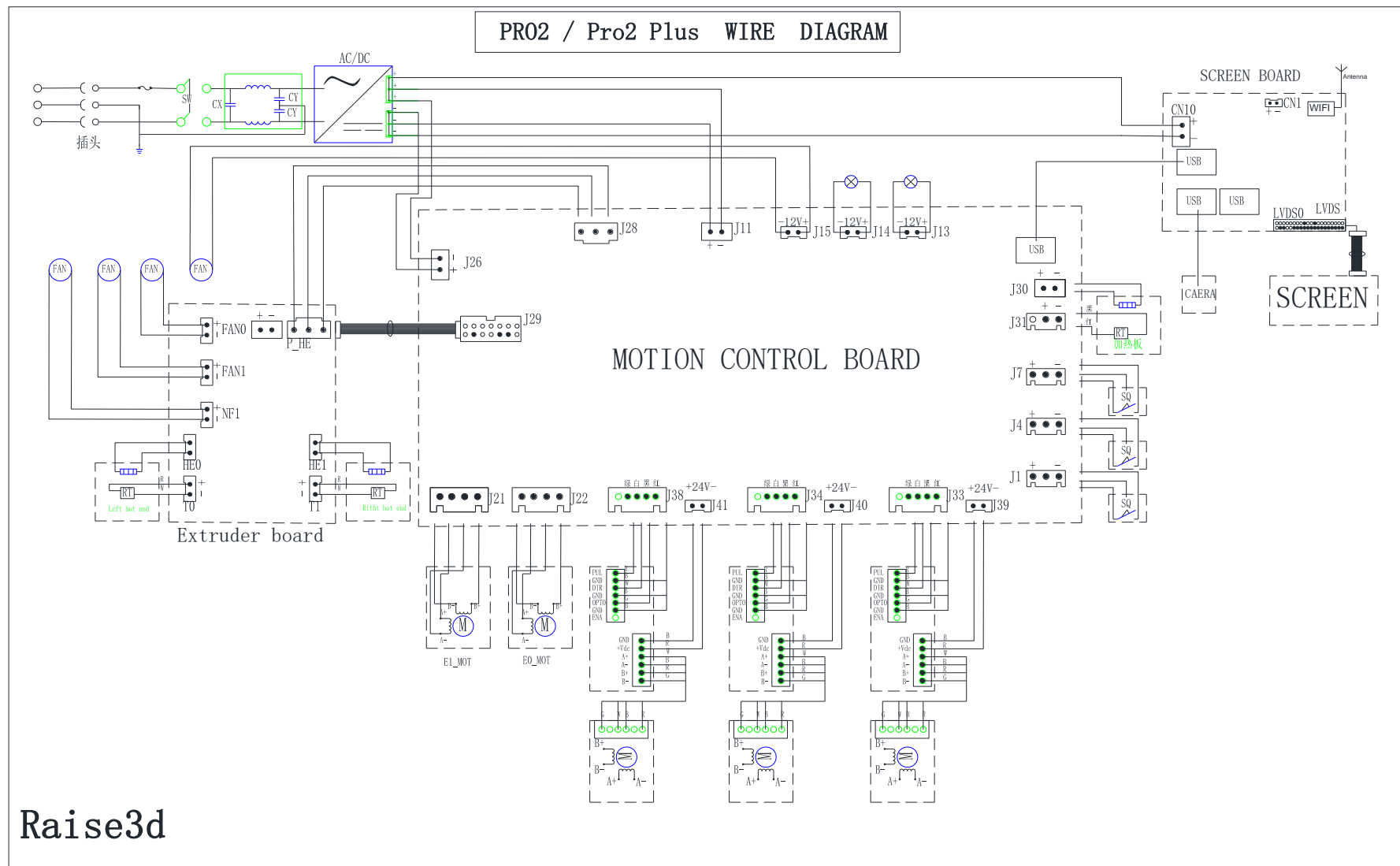*Figure 1.40: Inputting Network's Name*

WIRE DIAGRAM

● Wire Diagram

PRO2 / Pro2 Plus WIRE DIAGRAM

MOTION CONTROL BOARD

SCREEN BOARD

SCREEN

Extruder board

Raise3d