

ginger.
additive

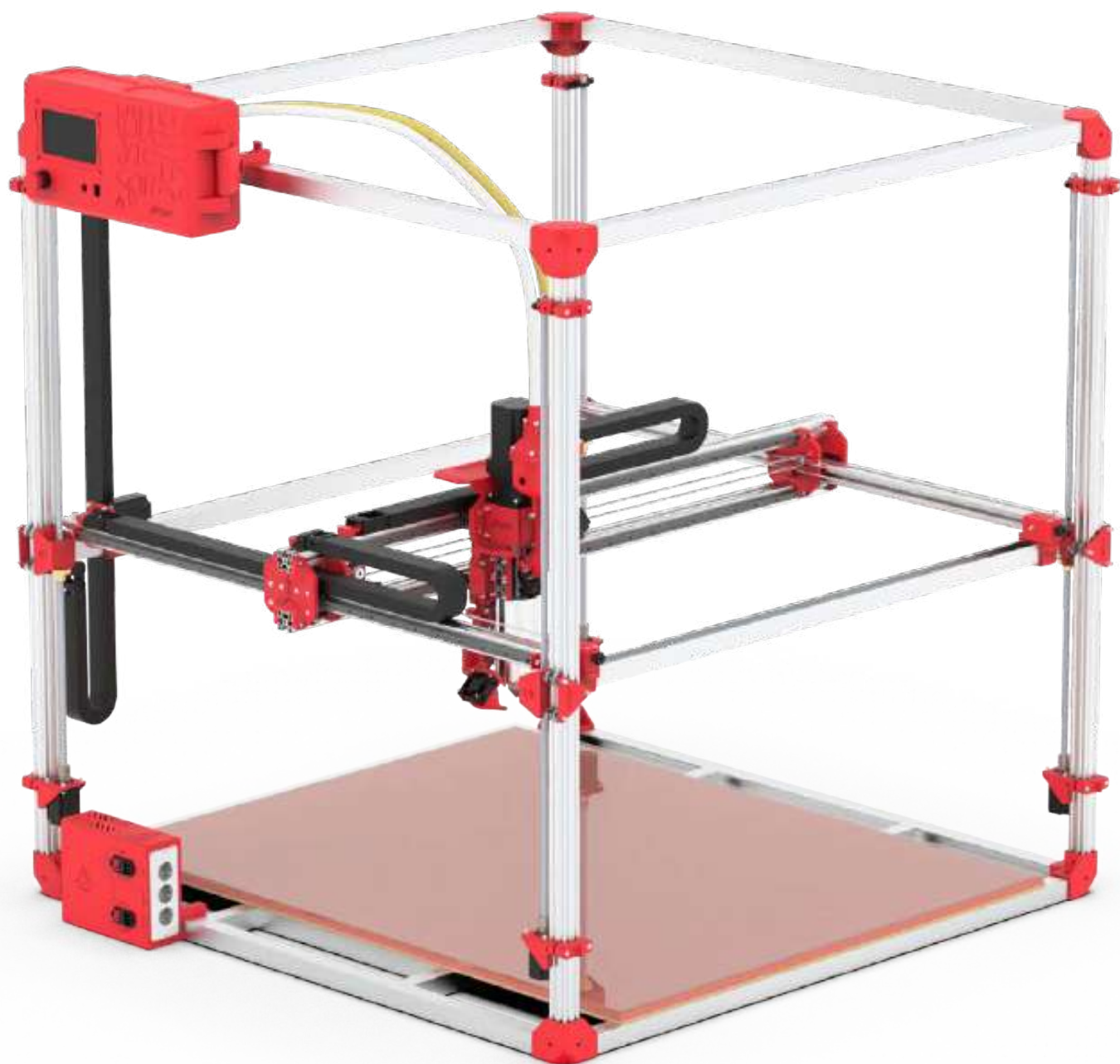


The affordable
large scale
FGF 3D printer

ORIGINAL INSTRUCTIONS

gingeradditive.com





PREFACE

This manual 'G1 - Original Instructions' has been drawn up in accordance with standard UNI EN ISO 20607, 'Safety of machinery - Instruction handbook - General drafting principles'. The manual has been prepared and checked to the best of the Manufacturer's ability. The Manufacturer is not liable for its use and reserves the right to make changes to the product and the information provided herein without prior notice.



OBLIGATION: No part of this document may be copied, duplicated, reproduced, stored in any data storage system, translated into any language or transmitted by any data communication system without the consent of the manufacturer.

ABOUT THE MANUFACTURER

Ginger Additive s.r.l.s.

Via Vittorio Veneto 44

20093 San Maurizio al Lambro (MI) – Italia

gingeradditive.com

Ginger Additive develops, manufactures and sells machinery for large-format 3D granule printing. The company's mission is to develop digital fabrication technologies in such a way that they are accessible in terms of economic opportunities and functionality for practical everyday use.

DOCUMENT VERSION

The following table shows the current version of the document and all possible others:

ES	DA	DE	EL	EN	FR	IT	NL	PT	FL	SV	CS	ET	LV	LT	HU	MT	PL	SK	SL	BG	RO	GA
				X																		

Table 1 - Document version

The language of the document and drawings is subject to contractual negotiations with the user. In the case of 'Translation Instructions', the machine manufacturer also provides the 'Original Instructions' document.

DOCUMENT REVIEW

The following table shows the current revision of the document:

Revision	Description	Prepared by	Verified by	Approved	Data
1	Prima emissione	B. Bellagente	D. Malnati	U. Bisotti	01/07/2023

Table 2 - Revision of the document

GLOSSARY

The following table lists the terminologies adopted within the manual:

Term	Description
The Manufacturer	Ginger Additive s.r.l.s.
The Machine	G1
The user	End user of the machine

Table 3 - Glossary



SYMBOLS

The following table shows the symbols adopted:

	Description
	OBLIGATION: Warning about the obligation to perform a certain operation specified by further symbols and/or warnings
	PROHIBITION: Warning about the absolute prohibition of performing a given action, specified by further symbols/warnings
	DANGER: Warning about the danger of performing an action, specified by additional symbols and/or warnings

Table 4 - Symbols

PROFESSIONAL FIGURES

The following table lists the professional figures considered when using the machine described in this manual:

Symbol	Professional figure	Description
	Installer	Professionals with specific technical requirements who carry out machine installation and electrical, hydraulic and pneumatic connections.
	Operator	Qualified person using the machine for its own and permitted uses; person authorised to clean the machine.
	Maintainer	Qualified figure capable of carrying out ordinary or extraordinary maintenance work of an electrical, hydraulic or pneumatic nature, following the instructions in this manual. A person also authorised to clean and dismantle the machine.

Table 5 - Professional figures



PROHIBITION: Professionals and non-professionals excluded from the list are prohibited from using the machine.

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1. IDENTIFICATION

1.1. Plate and type designation

The following figure shows the layout of the vehicle's plate:



Figure 1 - Layout of the vehicle's plate

The following table summarises the identifying data of the vehicle present on the plate:

Dato	Descrizione
Designation	Official name of the machine
Model	Machine model
Type	Type of machine
Year	Year of manufacture of the machine
Serial number	Machine serial number

Table 6 - Identifying data of the vehicle



OBLIGATION: In the event of loss of the plate due to detachment from the machine, you must request a copy of the plate from the Manufacturer, sending the information available within this same manual.

1.2. Name and address of the Manufacturer

The following table shows the data related to the Machine Manufacturer:

Term	Description
Name	Ginger Additive s.r.l.s.
Address	Via Vittorio Veneto 44 San Maurizio al Lambro 20093 (MI) Italia
Phone	+39 346 6266578
Website	gingeradditive.com
E-Mail	info@gingeradditive.com

Table 7 - Data of the machine manufacturer

1.3. Warranty

Refer to the "Testing Contract - G1" agreed upon at the time of purchase of the machinery.

1.4. Useful Life

The useful life of the machine is estimated at 10 years from the first start-up. This value is only valid if all the instructions in this manual are followed.



OBLIGATION: Comply with all warnings stated in this manual, both regarding the use of the machine and its maintenance and cleaning.



PROHIBITION: Do not allow use by personnel not trained on the machine, who have not received adequate training or do not possess the necessary skills for its use and maintenance.



DANGER: Improper use of the machine may pose a risk to people and/or property; refer to the residual risks described in this manual for specific hazards related to incorrect use of the machine.

1.5. Declaration of Conformity CE

The machine covered by this manual is subject to the application of the Machinery Directive 2006/42/EC; therefore, a Declaration of Conformity CE is issued (see Annex 1).

1.6. Applicable standards

The following table shows which European Directives are applicable to the machine:

Directive	Description
2006/42/CE	Machinery Directive
2014/35/CE	Low Voltage Directive (its application is implied by the application of the aforementioned Machinery Directive, therefore it is not included in the CE Declaration of Conformity)
2014/30/CE	Electromagnetic Compatibility Directive

Table 8 - Applicable European Directives

The following table shows which standards are applicable to the machine:

Directive	Description
ISO 12100: 2010	Safety of machinery - General principles of design - Risk assessment and risk reduction
ISO/TR 14121-2:2013	Safety of machinery - Risk assessment - Part 2: Practical guidance and examples of methods
EN 60204-1: 2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements

Table 9 - Applicable standards

1.7. Other machines and their Declaration of Conformity

No other machines are included within the machine for which CE Declaration of Conformity has been issued in accordance with the Machinery Directive.

1.8. Quasi-machines and their Incorporation Declarations

No quasi-machines are included within the machine for which Incorporation Declarations have been issued in accordance with the Machinery Directive.

2. GENERAL DESCRIPTION

The following image shows the machine:

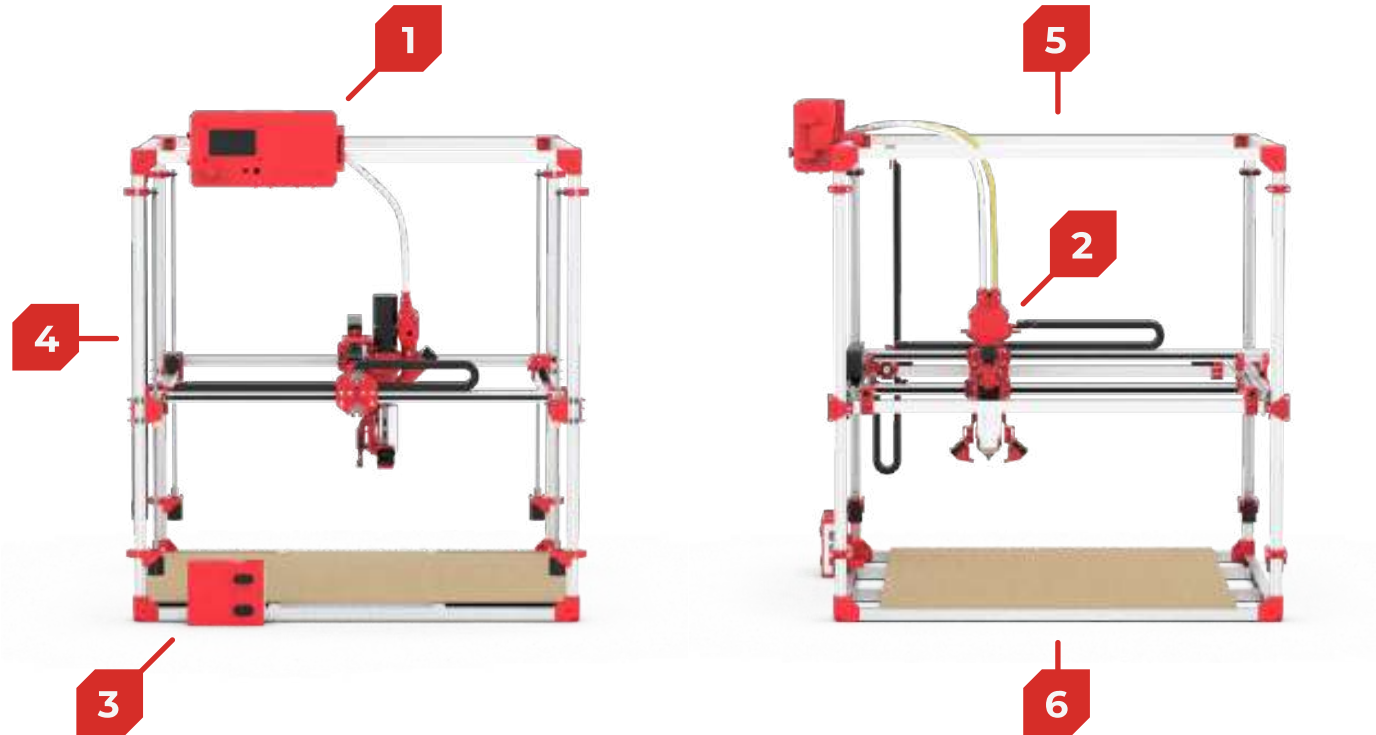


Figure 2 – Ginger.one

The following table lists the components of the machine:

Element	Description
1	Operator control panel
2	Extrusion head
3	Power supply and controlled socket
4	Vertical movement axes
5	Machine frame
6	Loading/unloading access side of the machine

Table 10 - Components of the machine

Refer to Appendix 2 for the machine's layout diagram.
Refer to Appendix 3 for the machine's electrical diagram.
Refer to Appendix 4 for the manuals and data sheets of the individual components of the machine.



2.1. Control Panel

The following image shows the control panel:

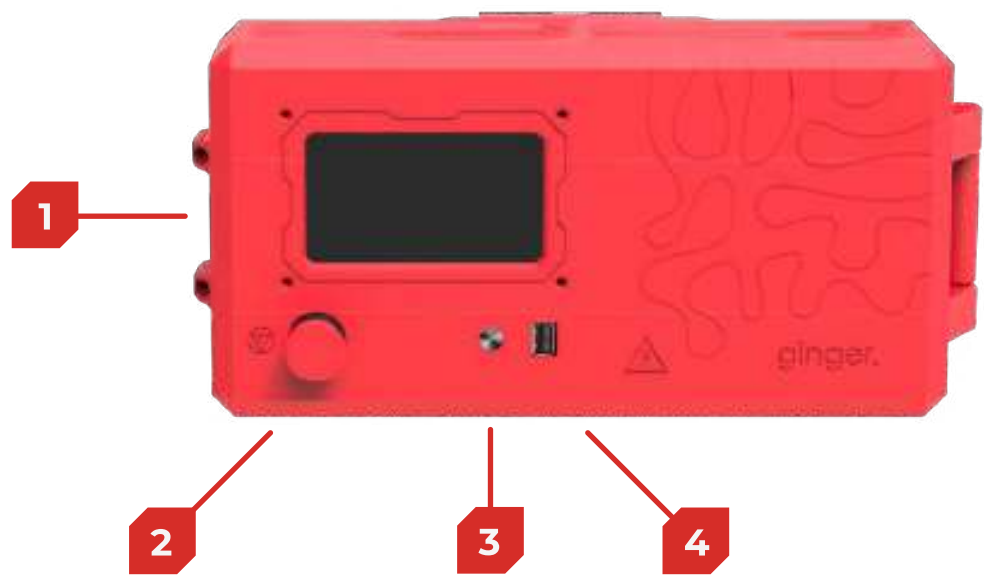


Figure 3 – Control Panel

The following table lists the elements of the control panel:

Element	Description
1	General touch control panel of the machine
2	Emergency button
3	Power on/off button
4	USB port

Table 11 - Elements of the Control Panel



2.2. Extrusion Head

The following image shows the extrusion head of the material:

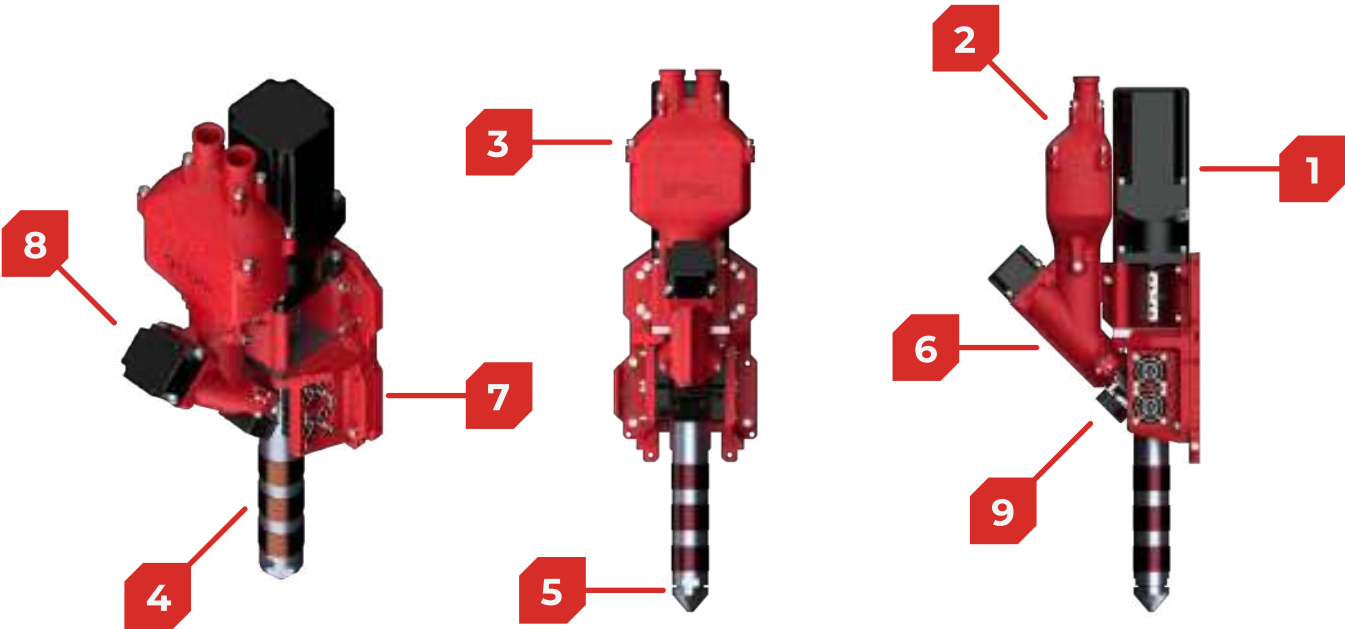


Figure 4 – Extrusion Head

The following table lists the elements of the extrusion head:

Element	Description
1	Main Motor
2	Hopper
3	Full Sensor
4	Heated Barrel
5	Nozzle
6	Screw Transport
7	Cooling Fans
8	Screw Motor
9	Knobs for Hopper Removal

Table 12 - Elements of the Extrusion Head

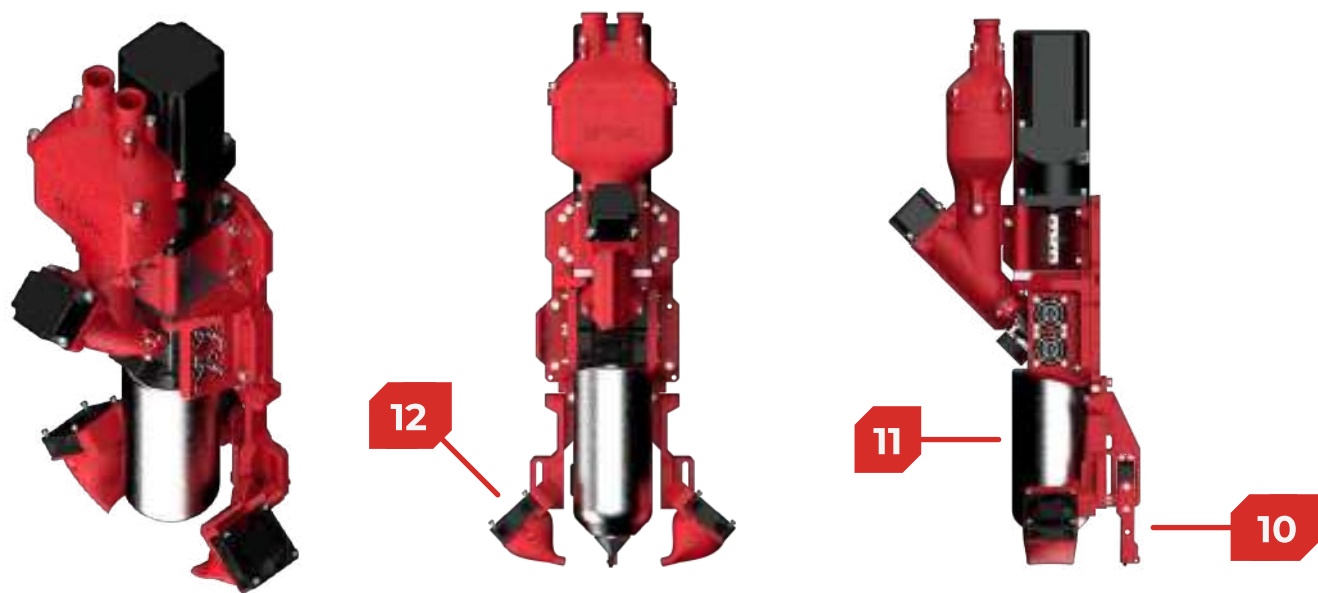


Figure 5 – Extrusion head 2

Elemento	Descrizione
10	Plate leveling sensor
11	Materassino isolante
12	Cooling fans for material

Table 13 - Elements of the extrusion head 2

2.3. Intended Use

The machine is designed and built to 3D print objects of various shapes, using exclusively thermoplastic polymers, including:

- PLA
- PETG
- PP
- HDPE
- EVA
- Virgin, shredded, or fibre-reinforced materials

The extruder is designed to work with various thermoplastic materials. The successful outcome of the printed piece depends on the material and its degree of polymerization, as well as the operator's skill in programming the printing parameters.



PROHIBITION: It is forbidden to use the machine for purposes other than those specified: incorrect use may lead to harm to persons and/or property.

2.4. Usage Limits

Any use of the machine different from that described in paragraph 2.1 is to be considered incorrect and is therefore strictly prohibited.



PROHIBITION: The use of the machine is permitted only for qualified and authorized personnel; it is prohibited for any other type of person to use the machine.



PROHIBITION: It is strictly forbidden to modify the layout of the machine without the authorization of the Manufacturer.



PROHIBITION: The machine is structured to be used by a single operator during the operating phase.



DANGER: It is dangerous to tamper with the machine and its accessories in order to modify its intended use.



DANGER: Any use different from that described in chapter 2.1 INTENDED USE may lead to harm to persons and/or property.

2.5. Dimensions and Weight

Total machine weight <100Kg.

For the dimensions of the individual machine components, please refer to the attachments.

2.6. Environmental Conditions

The following table lists the environmental conditions for the operation of the FRT test system:

Condition	Value
Ambient temperature for operation	(0÷+45) °C
Ambient temperature for storage and transport	(-25÷+70) °C
Maximum temperature gradient	1.1 K/min
Humidity class	EN 60204 point 4.4.3
Atmosphere	Free from flammable, explosive, or corrosive gaseous substances

Table 14 – Environmental Conditions for Use

It is required that the control system components be placed in a covered and dry location.

2.7. Connections

2.6.1. Electrical Connection

The following image shows the connection point of the electrical network to the machine:

The electrical connection requires
220 VAC (50 Hz).

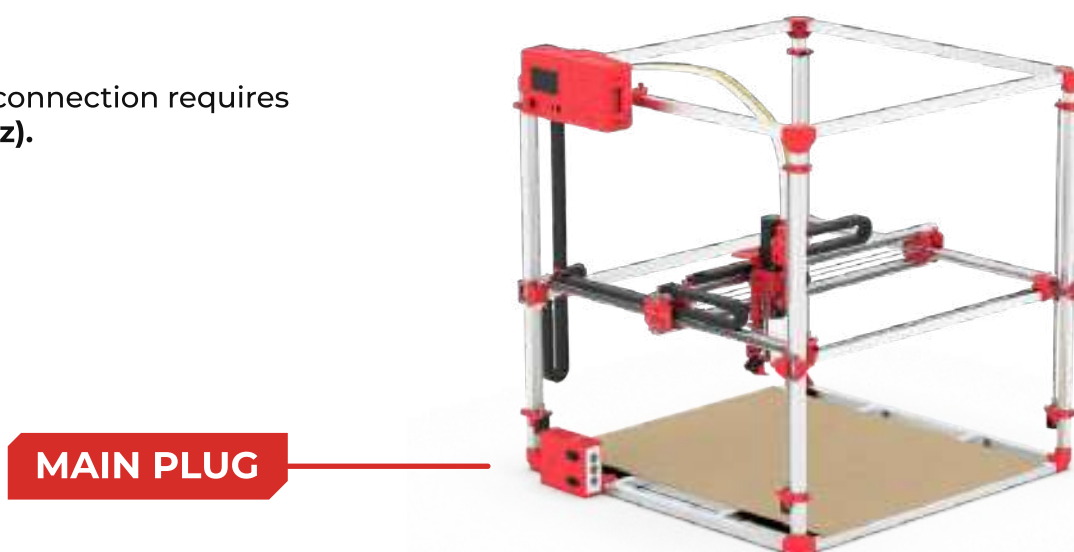


Figure 6 – Connection point to the network

2.6.2. Connection to PC

The following image shows the connection point of the machine to a PC:

Connecting to a PC requires a USB-A cable.

From this port, it is possible to control the machine's kinematics and start a print file, as well as connect external cameras, accelerometer sensors, or anything else directly connected to the Raspberry Pi.



Figure 7 – Connection point for PC

- * Refer to section 6.3 to find the IP address and connect the printer to Mainsail, making it remotely controllable.

3. SAFETY

3.1. General Warnings



CAUTION: The operator must undergo a training period for the use of the machine.



PROHIBITION: Unauthorised and unqualified personnel must not operate, adjust, conduct, or repair the machine. Refer to this manual for any necessary information.



PROHIBITION: Ensure that there are no unauthorised persons nearby before operating the machine.



PROHIBITION: Do not tamper with the electrical, pneumatic, and/or hydraulic systems or any other mechanism. Do not remove safety devices.



PROHIBITION: If using a pacemaker, check its compatibility with the machine.



PROHIBITION: Do not wear rings, wristwatches, jewellery, torn or loose clothing such as ties, scarves, unbuttoned jackets, or any item that could get caught in the machine parts.



CAUTION: Operate the machine or work nearby while considering the information provided on the labels affixed to it.



OBLIGATION: The operator must have carefully read this manual and acquired the necessary knowledge of the technical specifications and controls of the machine before proceeding to operate it.



OBLIGATION: Check that all safety devices (barriers, guards, covers, micro-switches, etc.) have not been tampered with and are fully operational before operating; if not, restore them.



WARNING: The Manufacturer disclaims any responsibility for any damage to persons and/or property due to non-compliance with both safety regulations and the rules stated herein.



WARNING: In case of doubt, please contact the Manufacturer's technical support service.

3.2. Emissions



WARNING: The measured sound pressure level in the machine's operating area is below 80 dB(A).



WARNING: There are no sources of the following present on the machine:

Radioactive material or ionizing radiation
Laser radiation
Non-ionizing radiation
Biological hazard material.

3.3. IP Code

No specific IP rating is required: the machine is supplied with individual parts that have their own IP rating.

3.4. Electromagnetic Compatibility

The Electromagnetic Compatibility Directive applies to the Electrical System and all electrical/electronic components beneath it.

3.5. PPE – Personal Protective Equipment



MANDATORY: The operator must wear suitable head protection.



MANDATORY: The operator must wear suitable hand protection.



MANDATORY: The operator must wear suitable foot protection.



MANDATORY: The operator must wear suitable body protection.



MANDATORY: The operator must wear suitable eye protection.

3.6. Environments with explosion risk



DANGER: The machine is not suitable for use in explosive environments.

3.7. Residual Risks

The following table lists the residual risks present on the machine:

Condition/Part	Risk Factor	Implemented solutions
Area of movement of shafts	 Crushing hazard.	Use appropriate PPE Read the manual Check the safeguards
Material extrusion area	 Burn hazard.	Use appropriate PPE Read the manual Check the safeguards
Control panel and electrical connection area	 Electric shock hazard.	Use appropriate PPE Read the manual Check the safeguards

Table 15 – Residual Risks



PROHIBITION: The machine is designed to be operated by a single operator during the operating phase: the presence of two operators is expressly prohibited during the operation of the machine.

3.8. Protections

3.8.1. Safety Design Measures

The machine has been designed applying the following safety design measures:

Electrical system constructed in accordance with standard EN 60204-1
 Hot parts protected by appropriate covers
 Control panel positioned ergonomically for operator use
 Sizing of mechanical parts in compliance with applicable regulations

3.8.2. Protective Measures

The machine is supplied with the following personnel protection devices:

Emergency stop button chain

3.8.3. Warning Labels

The following image shows the location of the warning labels present on the machine:

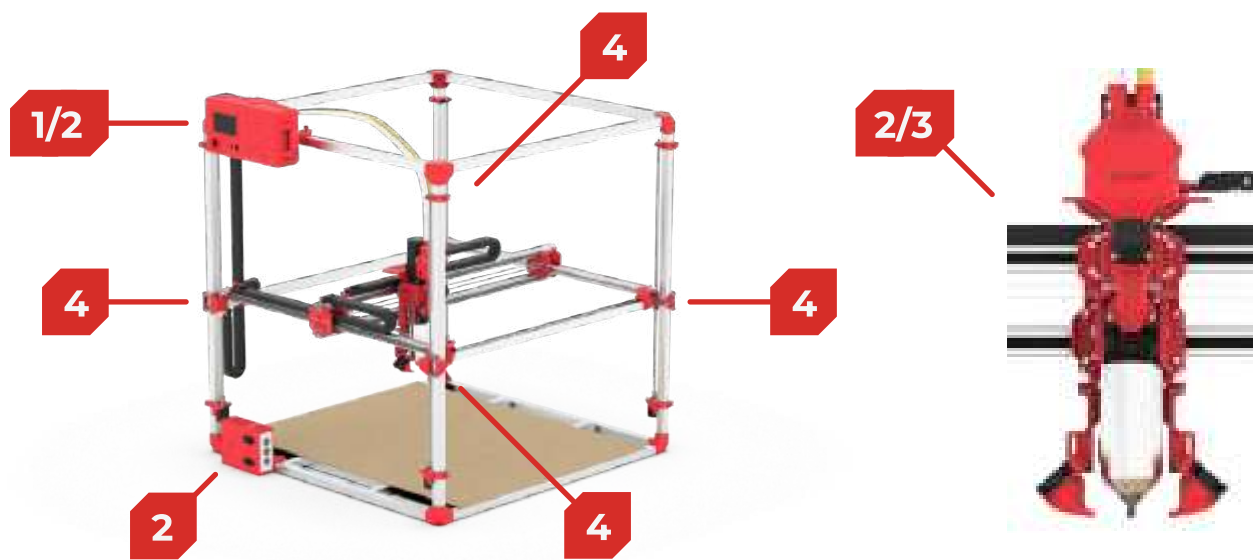


Figure 8 – Location of Warning Labels

The following table lists the warning labels present on the machine:

No.	No.	Description
1		Mandatory use of PPE during installation, setup, maintenance, and cleaning.
2		Danger: electric current
3		Danger: hot surface
4		Danger: crushing hands

Table 16 – Warning Labels

MANDATORY: In case of detachment and/or loss of labels, replace them with equivalent ones from the market.

3.9. Operational method in case of accident, malfunction, and fire.

How to act in case of **MACHINE BLOCKAGE**:

Remove the cause of the blockage indicated by the software.
Select the reset command from the software.
Ensure that the machine can operate safely and resume normal functionality.

How to act in case of an **ACCIDENT** while using the machine:

Stop the machine by pressing the emergency stop button.

If the injured person is trapped between parts of the machine, they must not be moved, and emergency medical services and the fire brigade should be called.

If the injured person is not trapped between the machine parts, call emergency medical services.

How to act in case of **MACHINE MALFUNCTION**:

Stop the machine by pressing the emergency stop button.

Consult the maintenance personnel of the facility and/or contact the Manufacturer's Service.

How to act in case of **FIRE** and hydraulic oil fire:

In case of fire, disconnect power to the machine by turning off the main switch of the electrical system, located upstream of the machine.

Call the fire brigade and activate the evacuation procedures outlined in the company's safety plans, paying attention to the use of any personal protective equipment required.

If trained and specialized personnel are present for managing fire emergencies and first aid:

Carry out possible control operations and safely extinguish the fire using available means.
Remove any injured persons.



WARNING: Do not use water to extinguish fires on live electrical equipment.



DANGER: Extinguishing a fully developed fire is a complex operation that can only be carried out by trained personnel (firefighters) equipped with the appropriate gear.

4. PREPARATION OF THE MACHINE FOR USE



OBLIGATION: Personnel performing transport, handling, and installation operations must wear personal protective clothing and equipment, as prescribed by the regulations in force in the country of use.



PROHIBITION: Use appropriate means (barriers, warning signs, etc.) to ensure that access to the area where lifting operations are taking place is restricted to individuals not directly involved in the work.



CAUTION: The lifting of the machine or its parts must be carried out by specialized personnel (forklift operators, crane operators, etc.) who are authorized to use the equipment; if the dimensions do not allow for sufficient visibility, assistance from a ground person to signal obstructions is necessary.



OBLIGATION: For both safety and the proper functioning of the machine, it is essential that the machine is connected to a grounding system that meets all requirements of industrial standards for accident prevention and complies with the current national regulations of the location where the machine is used.



CAUTION: The Manufacturer disclaims any responsibility for damages to persons and/or property caused by non-compliance with the current safety regulations related to lifting and moving materials, both inside and outside the facility.

4.1. Transport

The transport of the machine is carried out using a wooden crate, which can be moved with a pallet truck.

4.2. Storage

To store the machine, follow these rules:

Place all components in a closed area, protected from the elements.

Cover the machine components with appropriate plastic sheets or other protective material.

4.3. Installation and Assembly



CAUTION: The installation of the MACHINE IN BETA VERSION must be carried out in the presence and under the supervision of personnel from the Manufacturer.

5. FUNCTIONING INSTRUCTIONS



WARNING: Only one operator is allowed to be present during the operation of the machine.



MANDATORY: The operator must undergo a training period for the use of the machine.



MANDATORY: The operator must have carefully read this manual and acquired the necessary knowledge of the technical specifications and controls of the machine before proceeding to operate the machine.



PROHIBITION: Unauthorized and unqualified personnel must not operate, adjust, conduct, or repair the machine. Refer to this manual for any necessary information.

5.1. Machine Start-up

Use the main switch to power the machine:

MAIN SWITCH

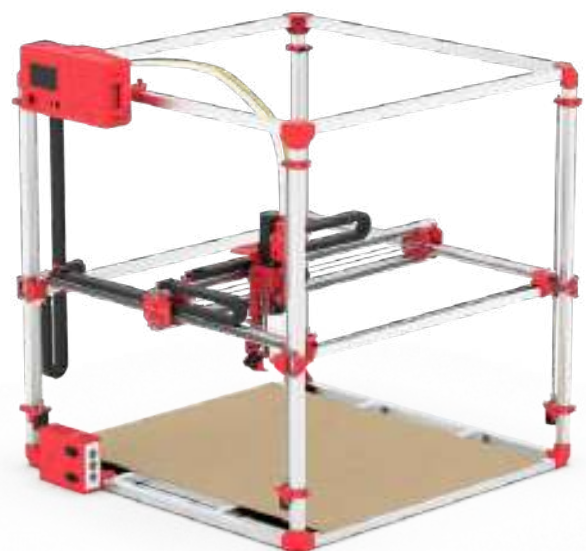
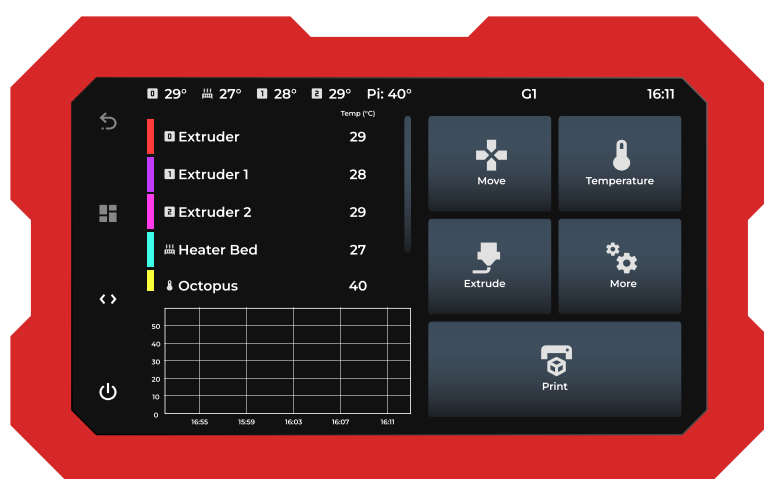


Figura 9 – Interruttore generale

If the machine is powered correctly, the two screens on the control panel will light up and display their respective Home screens:



Power-up Screen



Home Screen

Figure 10 – Control panel screens



5.2. Interface (HMI)

5.2.1. Menu Navigation

The following image shows the Home panel:

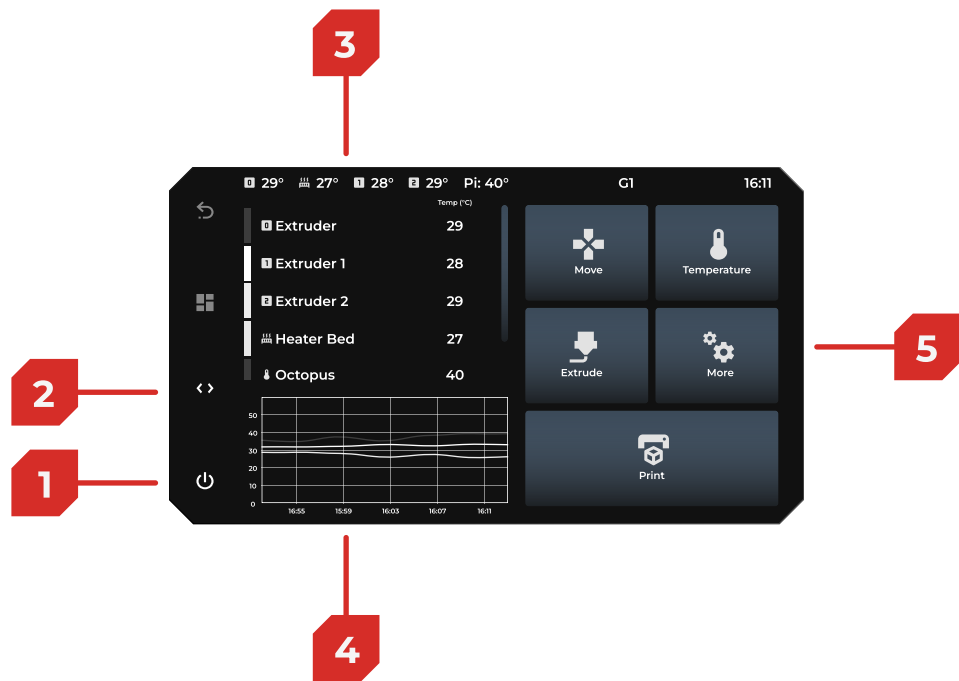


Figure 11 – Menu screen

The following table lists the functions of the Home panel:

Element	Description
1	Shutdown
2	List of all Macros
3	Real-time Temperature List
4	Temperature Trend Graph
5	Operations Menu

Table 17 – Elements of the menu screen



5.2.2. Temperature and Print Material Management

The following image shows the Temperature panel:

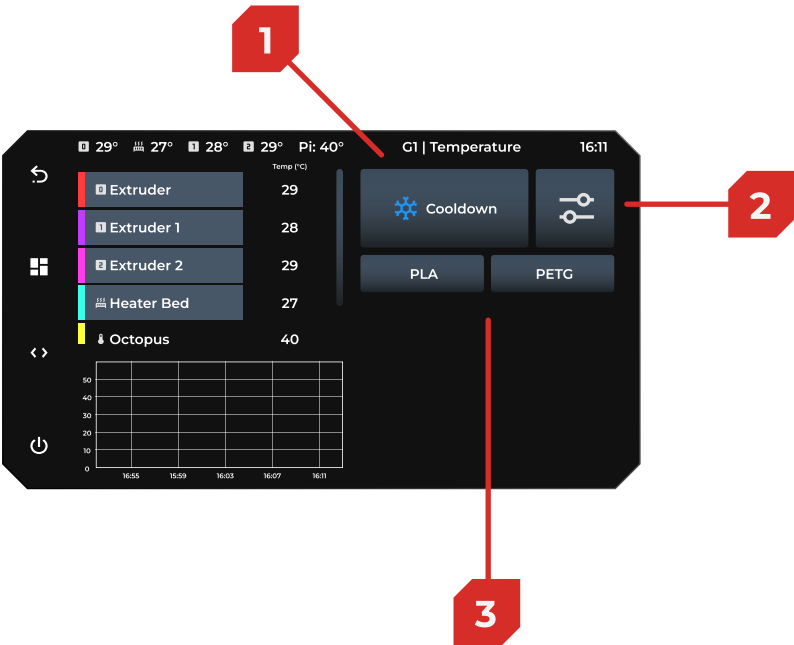


Figure 12 – Temperature Screen

The following table lists the functions of the Temperature panel:

Element	Description
1	Stops heat transfer and cools the extruder
2	Sets the temperature of the extruder
3	Pre-set material library

Table 18 – Elements of the temperature screen

5.2.3. Extruder Management

The following image shows the Extrusion panel:



Figure 13 – Extrusion Screen

The following table lists the functions of the Extrusion panel:

Element	Description
1	Temperature indicators
2	Set the cubic mm of material to extrude
3	Set the print head speed
4	Feeder ON / OFF switch (Feeder status: off)
4.1	Feeder status: On
5	Extrudes the specified quantity of material
6	Load
7	Unload
8	Retracts the specified quantity of material

Table 19 – Elements of the extrusion screen



5.2.4. General Printer Configuration

The following image shows the General Configuration panel:

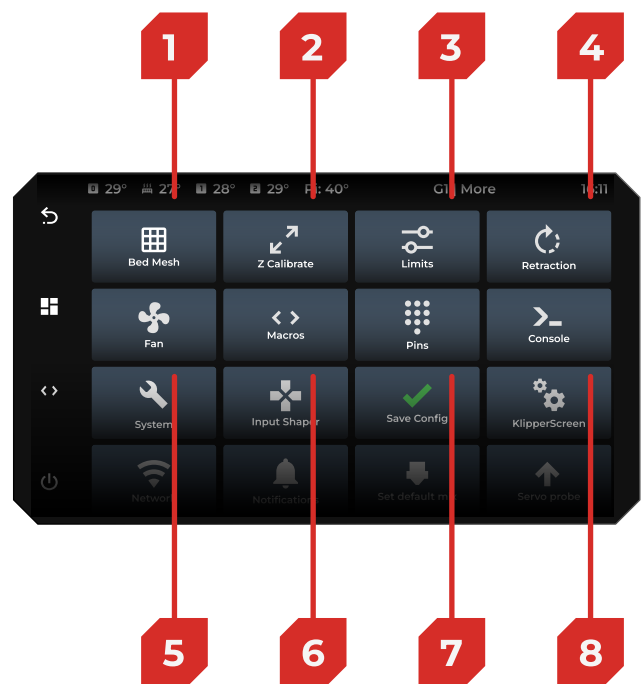


Figure 14 – General configuration screen

The following table lists the functions of the General Configuration panel:

Item	Description
1	Automatic bed leveling
2	Probe offset calibration
3	Kinematics limits
4	Firmware retraction menu
5	Entole menu
6	Macro menu
7	Pins
8	Terminal

Table 20 – Elements of the general configuration screen

5.2.5. General printer configuration 2

The following image shows the General Configuration panel:



Figure 15 – General configuration screen 2

The following table lists the functions of the General Configuration panel:

Element	Description
1	Task Management
2	Input Shaper Menu (vibration analysis)
3	Save Configuration
4	KlipperScreen
5	Wi-Fi Connection Manager
6	Notifications
7	Set default values
8	Manual probe control
9	Lower the gantry without the need for homing

Table 21 – Elements of the general configuration screen 2



6. PROCEDURE

6.1. Firmware Update

Upon powering on, if any are available, the machine will propose the update.



Figure 16 – Screen with firmware update notification

Pressing CANCEL keeps the currently installed version, and the request will be repeated at the next power-on. Pressing UPDATE will install the update immediately.

6.2. Change Wi-Fi Network

From the main menu, I open More and then Network, after which I configure the Wi-Fi network.

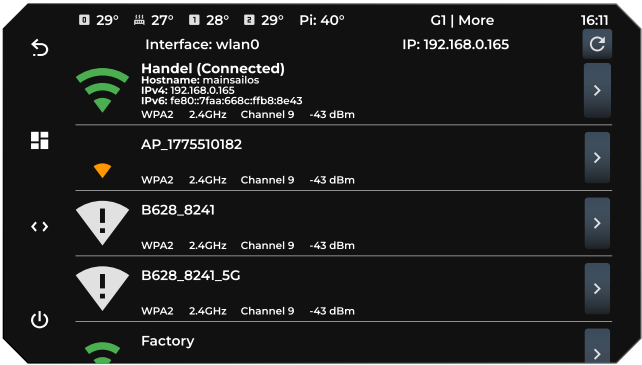
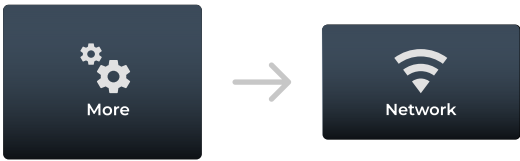


Figure 17 – Wi-Fi network configuration screen



!! Dimensional limits of the layer lines

The table below shows the maximum and minimum measurements of the layer lines.

	ø 1.5 mm	ø 3 mm	ø 6 mm	ø 8 mm
 H. min layer	1 mm	1 mm	1 mm	1 mm
 H. max layer	1 mm	1.8 mm	3.5 mm	4.5 mm
 L. min layer	1.6 mm	3.2 mm	6 mm	8 mm
 L. max layer	3 mm	6 mm	10 mm	18 mm

Table ?? – Dimensional limits of the layer lines

6.3. Finding the IP Address

In the More section, under System, you can read your IP address.

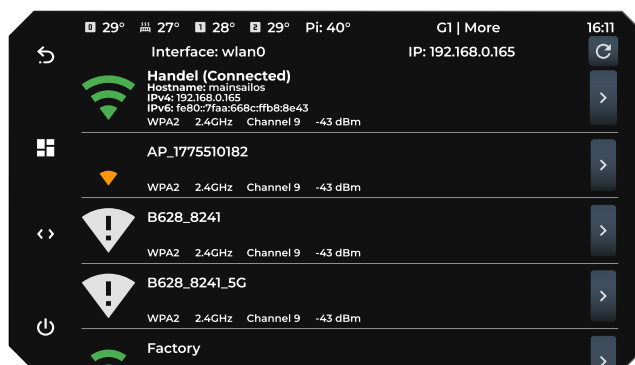


Figure 18 - IP Address Screen

6.4. Power On

Power the box with 220VAC, switch on the main switch and turn on the machine using the (Power) button on the control panel.



220VAC PLUG



POWER BUTTON

Figure 19 - Power Supply Box

Figure 20 - Control Panel

6.5. Manual Gantry Calibration

Rotate the 4 Z screws (Figure 20) and then check that the distance of the Gantry is equal at all 4 corners (Figure 21).

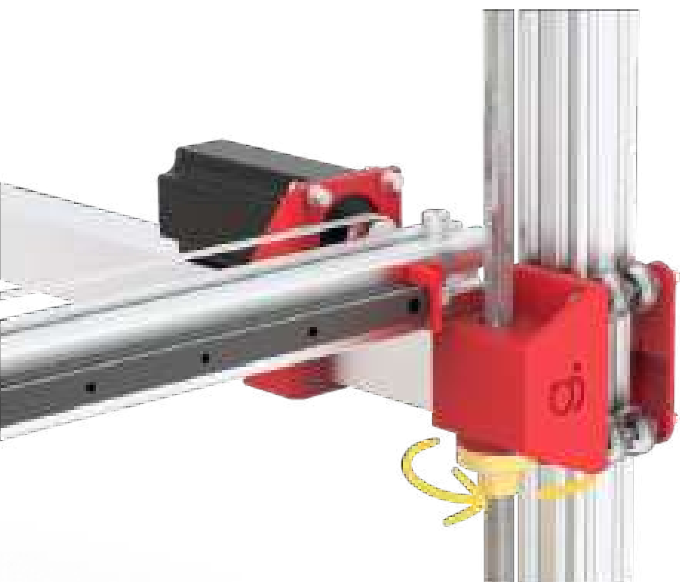


Figure 21 - Z Screw

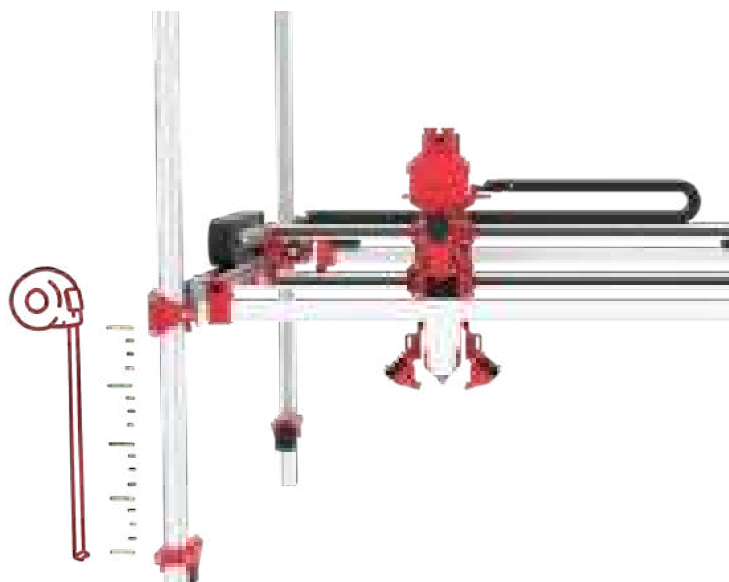


Figure 22 - Gantry

6.6. Manually Move the Print Head

By opening the Move section, you can move the print head by specifying the direction and distance of the desired movement.



Figure 23 - Movement Screen

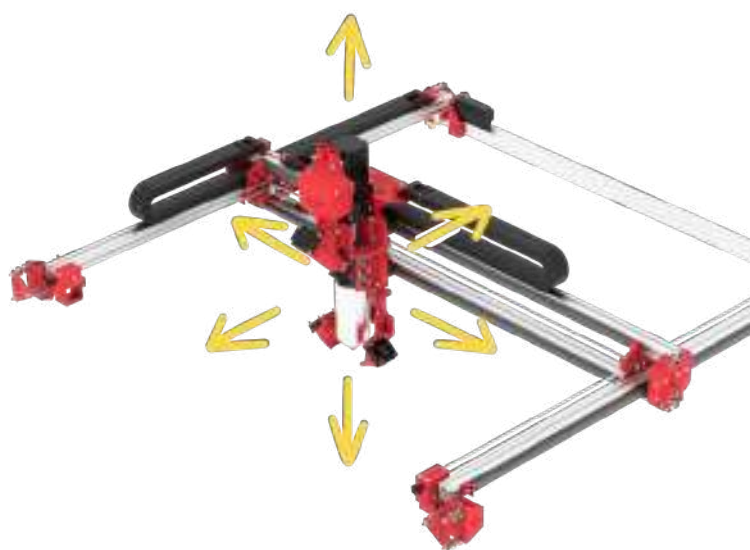


Figure 24 - Print Head

* The same operation can be performed remotely using MAINSAIL.

6.7. Manually set the nozzle temperature

In the Temperature section, open the settings, select the value in °C, and manually increase or decrease using the + and - buttons.

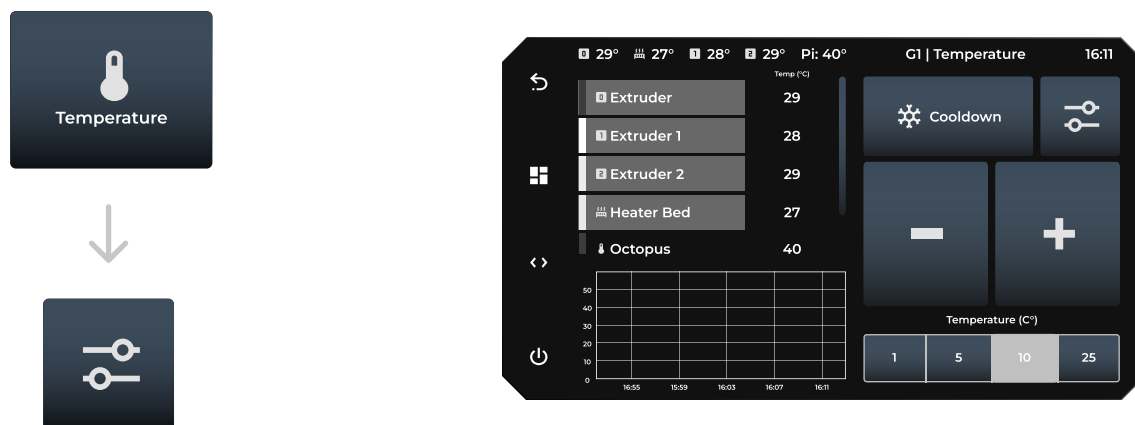


Figure 25 - Temperature Screen

* The same operation can be performed remotely using MAINSAIL.

6.8. Manually extrude

WARNING: Before extruding, it is necessary to bring the print head to the correct temperature for the loaded material.

Select the Distance, expressed in mm, and the Speed, expressed in mm/s, and finally the Extrude command.

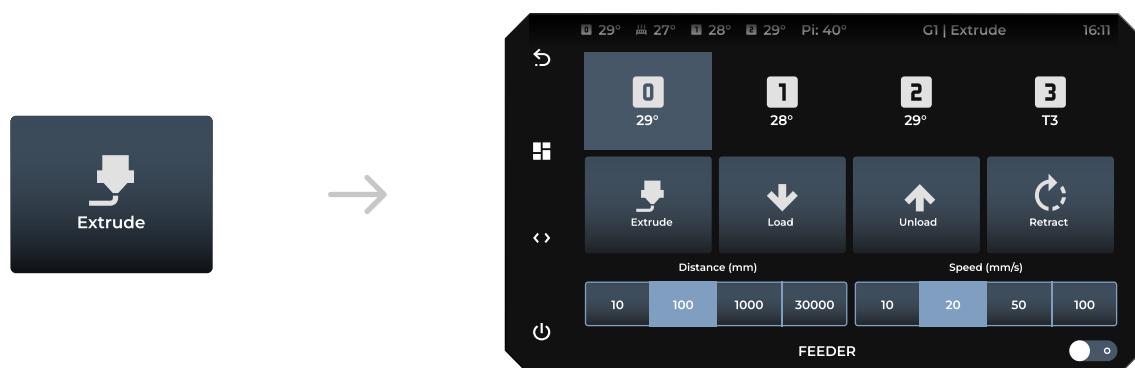


Figure 26 - Extrusion Screen

* The same operation can be performed remotely using MAINSAIL.

6.9. Automatic bed calibration

To perform automatic calibration, open the More section, go to Bed Mesh, and start leveling, either globally or partially (mesh 1, 2, 3...).

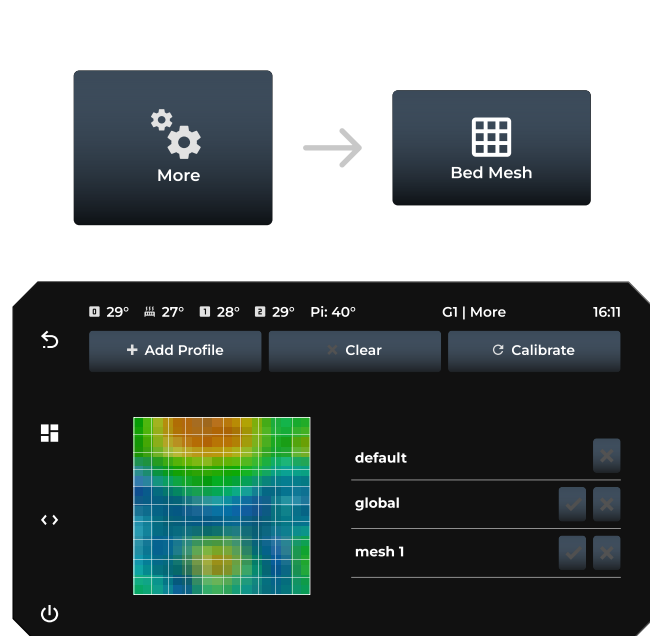


Figure 27 - Bed calibration screen



Figure 28 - Automatic bed calibration

6.10. Material Change

Unscrew the two black knobs (figure 29) and pull out the screw body (figure 30), then remove the hopper (figure 31) to clean it and insert the new material.

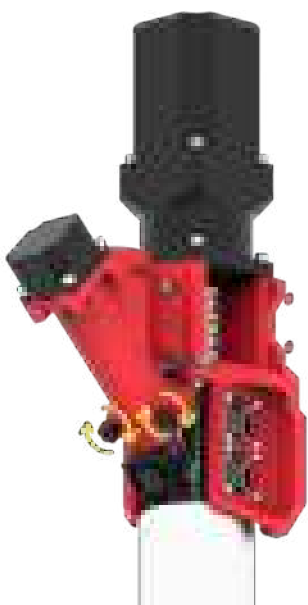


Figure 29 - Unscrew knobs

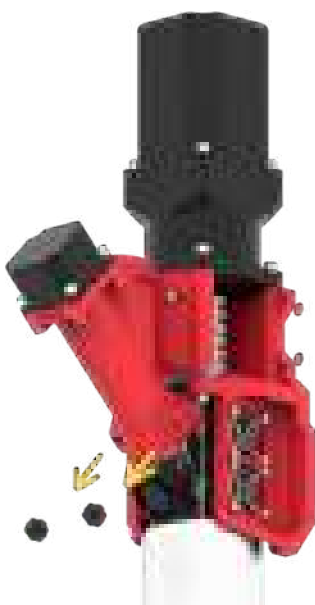


Figure 30 - Knob removal



Figure 31 - Hopper removal



6.11. Nozzle change

WARNING: before making the change, it is necessary to bring the print head to a temperature of 170° to remove the old material settled in the barrel. Use heat-resistant gloves during the procedure.

Unscrew the nozzle, remove the old material, wrap Teflon tape around the thread of the new nozzle, and then screw it in.



Figure 32 - Unscrew nozzle



Figure 33 - Removal of old material residues



Figure 34 - Screw in nozzle

6.12. Printing

I learn the Print menu, I can see the entire history of previous prints and, if inserted, the printable files available on the USB.

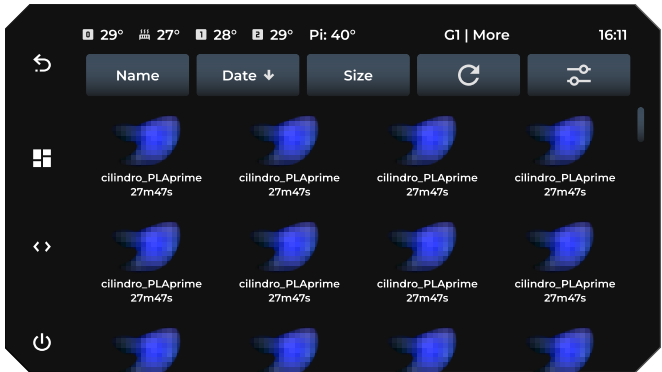
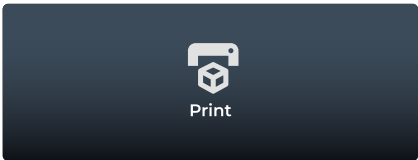


Figure 35 - Printing screen

6.13. Adhesion to the plate

Adhesion to the plate depends on the material I am printing on:

MDF (figure 36): it is recommended to design a brim with rings, stop the print after the first layer and use them to manually screw the piece to the plate.

GLASS (figure 37): it is recommended to spray some hairspray just before starting the print.

HEATED BED (figure 38): Thanks to the controlled temperature, it minimizes adhesion issues.

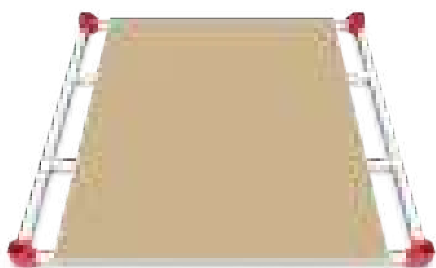


Figure 36 - MDF Plate



Figure 37 - Glass Plate



Figure 38 - HEATED BED

6.14. Manual loading of the granule

With the hopper open and without the feeding filter, manually pour the granule inside.



Figure 39 - Hopper Filling

6.15. Automatic loading of the granule

Thanks to the Auto-Feeding system, the loading of material is automated.

WARNING: The vacuum cleaner must be on throughout the entire printing process. Ensure that the feeder option is activated and that the two hoses are connected to the correct outlets [V = Vacuum (Vacuum Cleaner) P = Pellet (Granule)]

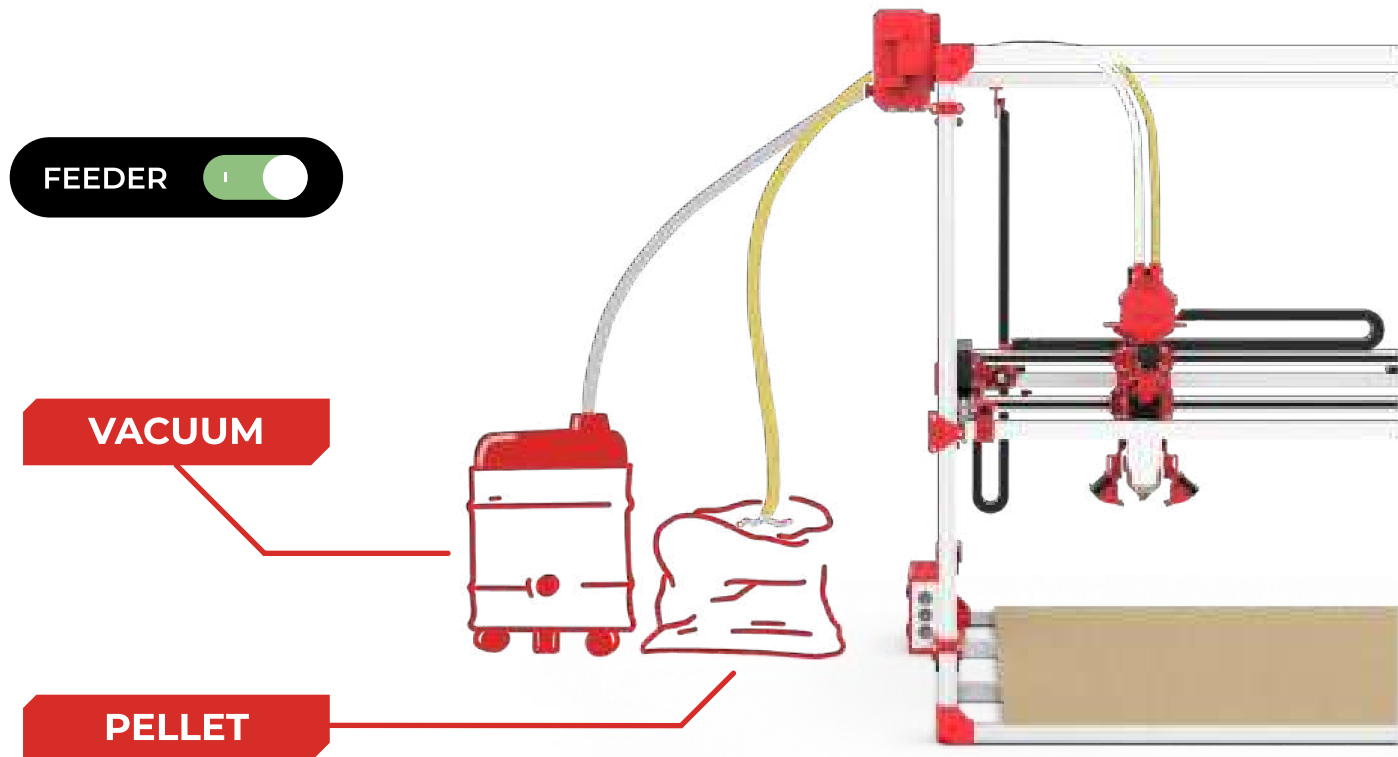


Figure 40 - Auto Feeding

6.16. Removal of the printed piece

WARNING: Before proceeding with the removal, ensure that the piece and the printer components have cooled down, for your safety and the quality of the piece.

For the MDF plate, you need to unscrew the piece, while for those in GLASS or HEATED BED, you can use a spatula.

Figure 41 - Removal of piece from MDF

Figure 42 - Removal of piece from glass and HB

6.17. Power Off

WARNING: Before turning off the machine, ensure that it has cooled down and that the print head has returned to room temperature.

Only once it is cold should you proceed to turn it off using the button on the control panel; finally, when the extruder is completely cold, you can disconnect the power supply from the power box.



 **BUTTON**

Figure 43 - Control Unit



220V AC PLUG

Figure 44 - Power Box

6.18. Assemble/Disassemble Heated Bed

Position the BED with the cables facing towards the power box, connect it to the socket marked "BED" and place the print plate (glass or stoneware) on top.

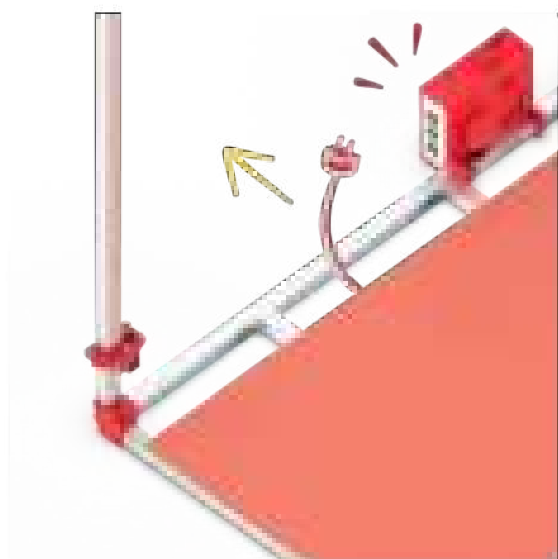


Figure 45 - Cable Direction

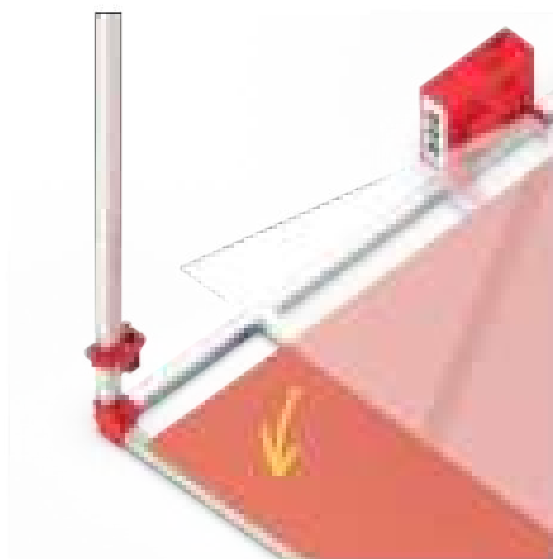


Figure 46 - Glass or Stoneware Placement

6.19. Assemble/Disassemble Feeder

Position the metal filter on the hopper, secure it with the 4 screws, and connect the 2 tubes: V = this should be connected to the vacuum cleaner that is connected to the socket marked "FEEDING."

P = this tube should instead end directly in the material container.

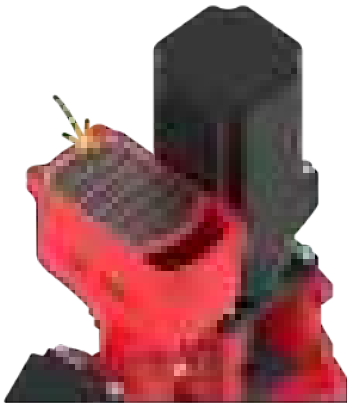


Figure 47 - Filter

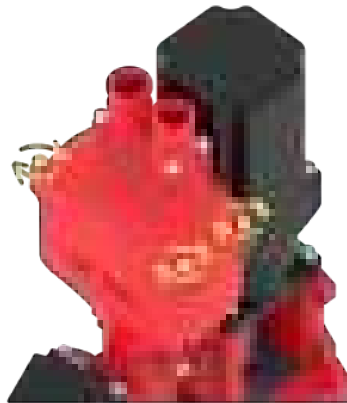


Figure 48 - Closure

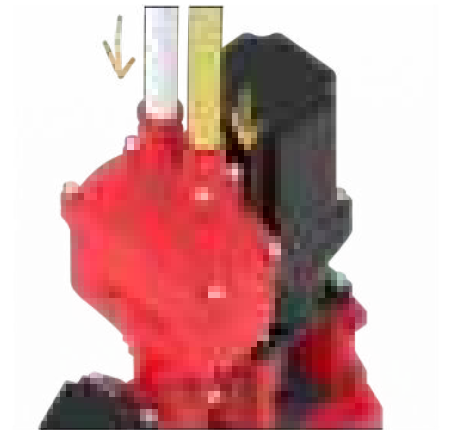


Figure 49 - Insertion of tubes

WARNING: The vacuum cleaner must remain on throughout the entire printing process. Ensure that you have the feeder option.

7. MAINTENANCE

7.1. Fan rotation control

Always ensure that when the printer is on, the 4 fans on the print head (figure 53) and the 2 under the control unit (figure 52) are rotating and free of dust on the grilles.



Figure 52 - Control unit fans



Figure 53 - Print head fans

7.2. Belt tension control

If the belt is loose (figure 54), use the tensioner; turning the knob (figure 55) can increase or decrease the tension.

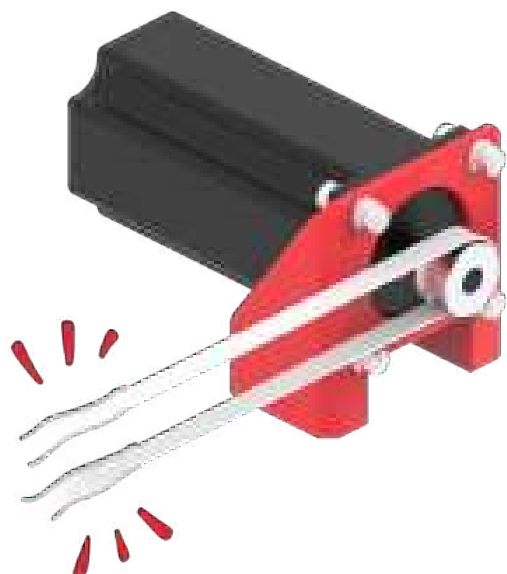


Figure 54 - Belt

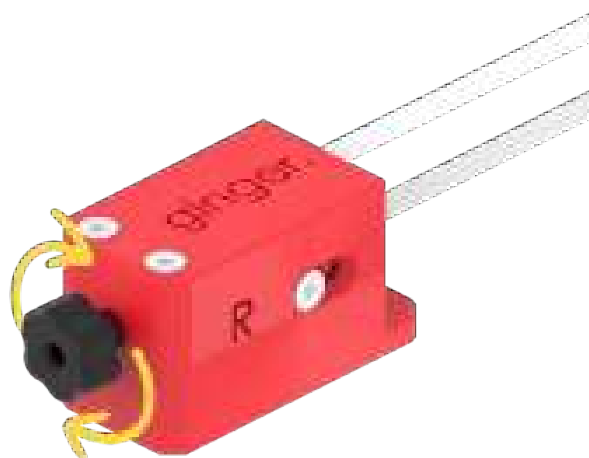


Figure 55 - Tensioner

7.3. Cleaning the hopper inlet

WARNING: To perform this operation, the machine must be turned off and cold.

I remove the hopper (as explained in section 6.10) and clean near the material entry door.



Figure 56 - Dirty inlet

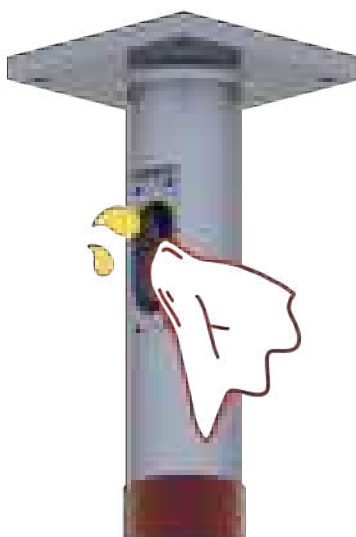


Figure 57 - Cleaning the inlet



Figure 58 - Clean inlet

7.4. Cleaning the feeding filter

Once the cap has been removed (as explained in section 6.19), I have access to the filter; just lift it out and it is free to be cleaned.



Figure 59 - Dirty filter

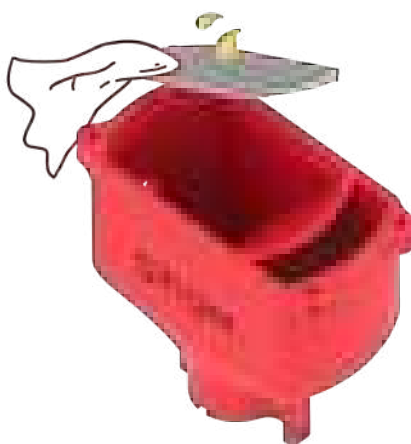


Figure 60 - Cleaning the filter

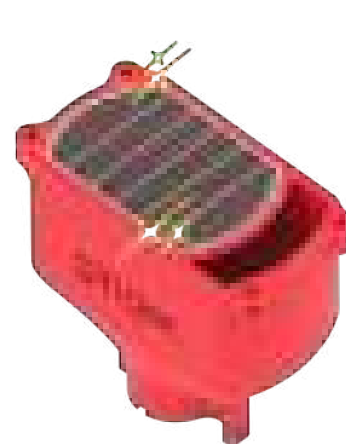


Figure 61 - Clean filter

7.5. Cleaning and greasing Z screws

The Z screws should be regularly cleaned and kept that way, especially from dust. After cleaning (figure 62), it is advisable to lubricate and grease them (figure 00) with the appropriate products.



Figure 62 - Cleaning screw



Figure 63 - Greasing screw

7.6. Troubleshooting, fault diagnosis and repair

All 3D printed components of the printer can be printed by the user if necessary or replaced after consulting the manufacturer. All part files are open-source and part of the accompanying documentation.

For any possible malfunction, please contact the manufacturer.



WARNING: Contact the maintenance manager without proceeding with further repair interventions for machine malfunctions or damage to components.



OBLIGATION: Before starting maintenance operations, the operator must wear appropriate personal protective equipment, as required by the regulations in force in the country of use.



OBLIGATION: Interventions must be carried out promptly at the first sign of anomalies, to prevent the worsening of the issue and damage to additional parts.



OBLIGATION: Before proceeding with the cleaning and/or maintenance of the machine and before removing any protection, ensure that the main switch is in the "OFF" position to disconnect the electrical supply to the machine during the operator's intervention.



OBLIGATION: Disconnect the power from the line to which the main switch is connected if work is to be done on it or in its vicinity.



OBLIGATION: Use only electrical equipment that is properly connected to the earth socket and complies with national safety regulations.



OBLIGATION: Interventions must be carried out promptly at the first sign of anomalies, to prevent the worsening of the issue and damage to additional parts.



WARNING: In case of irregularities or malfunctioning of any component of the machine, check that the instructions provided in the following paragraphs have been followed.



PROHIBITION: Do not wear rings, wristwatches, jewelry, torn or dangling clothing such as ties, scarves, unbuttoned jackets, or any item that could get caught in the machine parts.



WARNING: Keep all labels legible to ensure complete visibility to the operator. Replace any labels that have deteriorated for any reason or that are not clearly visible (refer to Chapter 3.8.3 WARNING LABELS).



DANGER: Do not carry out hasty or makeshift repairs that could compromise the proper functioning of the machine.



8. SPARE PARTS AND CONSUMABLE MATERIAL

The following table lists the spare parts for the machine:

No.	Model	Code	Supplier
1	V-slot trolley wheels	X-treme (polycarbonate)	Ginger Additive s.r.l.s.
1	V-slot trolley wheels	Metal	Ginger Additive s.r.l.s.

Table 22 - Spare Parts

The following table lists the consumables for the machine:

No.	Model	Code
1	Virgin PLA	Ginger Additive s.r.l.s.
1	Recycled PLA	Ginger Additive s.r.l.s.

Table 23 - Consumables

9. DISMANTLING

It is reminded that it is prohibited by specific legal provisions to abandon or disperse in the environment components or pieces of material that, due to their nature, may cause direct or indirect accidents or pollution.

9.1. Destruction

At the end of the operational life of the near-machine, it is advisable to proceed as follows:

Remove the identification label and keep it together with this manual and the documentation issued by the manufacturer.

Remove the lubricating oil from components or parts that may contain it, separating it into a suitable container.

Remove and separate electrical parts (cables, buttons, connectors, programmer, boards, electric motors, electrical and electronic components, etc.).

Remove and separate plastic parts (handles, screens, buttons, etc.).

Separate metal parts by type (steel, aluminium, cast iron, bronze, etc.).

The above operations can be carried out without the need for special equipment. No particular skills are required from the operators. When removing and dismantling metal parts, use protective gloves.

9.2. Recycling

Not applicable.

9.3. Disposal

Contact specialized companies for the differentiated disposal of the parts mentioned in the previous paragraph. Contact authorized companies for the disposal of substances and products used for lubricating machine parts.



10. ATTACHMENTS

The following table shows the attachments to this manual, which are an integral part of it; therefore, it is recommended to keep all documentation properly:

No.	Model	Code
1	Declaration of Conformity - No.00	CE Declaration of Conformity
1	DRAWING	Machine footprint diagram
1	ELECTRICAL SCHEMATIC	Wiring diagram
1	COMPONENTS	Data sheets and certificates of components

Table 24 - Attachments to the manual

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