# QZ portable Extruder

user and maintenance manual

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# ⚠ Safety instructions

When using any electrical appliance, basic safety precautions should always be observed.

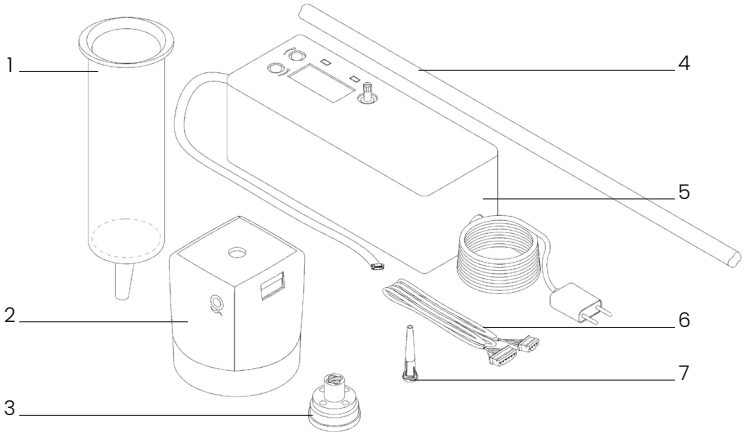
- If the appliance has any defect, do not attempt to repair it yourself. Contact info@quasizero.design for appropriate repairs.
- Regularly check that the cable and device are not damaged. Do not use the appliance if the cable shows signs of damage. If the cable is damaged, it must be replaced by the manufacturer, a technical service provider, or a similarly qualified person to avoid hazards.
- Check that the power supply voltage corresponds to that shown on the appliance's rating label before use.
- Ensure that the plug to be used has a ground connection.
- Make sure your hands are dry before touching an electrical device, cable, or plug.
- Do not immerse electrical appliances, cables, or plugs in water or any other liquid.
- Unplug the appliance when not in use.
- Disconnect the power cord from the electrical outlet by pulling on the plug, not the cable.
- Carefully clean the appliance after use.

# Parts list

Please keep the original box, as it may be needed for future shipping.

Inside the box you will find everything necessary to start printing:

1. Plastic tank 100 ml (x2)
2. Quasizero LDM Extruder
3. Rubber piston
4. Auger screw 200 mm
5. Manual extrusion control box
6. 4-Pin XH 2.54 to 6-Pin PH2.0 connector
7. Extra nozzle diameter 2 mm



# Usage instructions

## Before first use

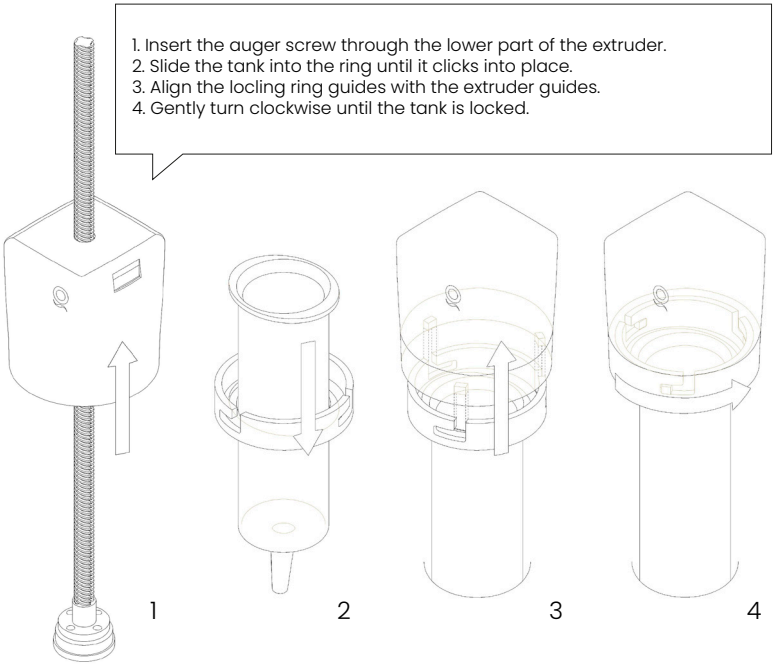
Make sure all parts of the product are present and in perfect conditions. Check that the piston slides smoothly inside the tanks. If it shows resistance, apply oil to facilitate movement.

## Assembly

Read the assembly instructions carefully before use. The product consists of two parts:

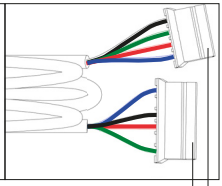
QZ Extruder
Manual control box

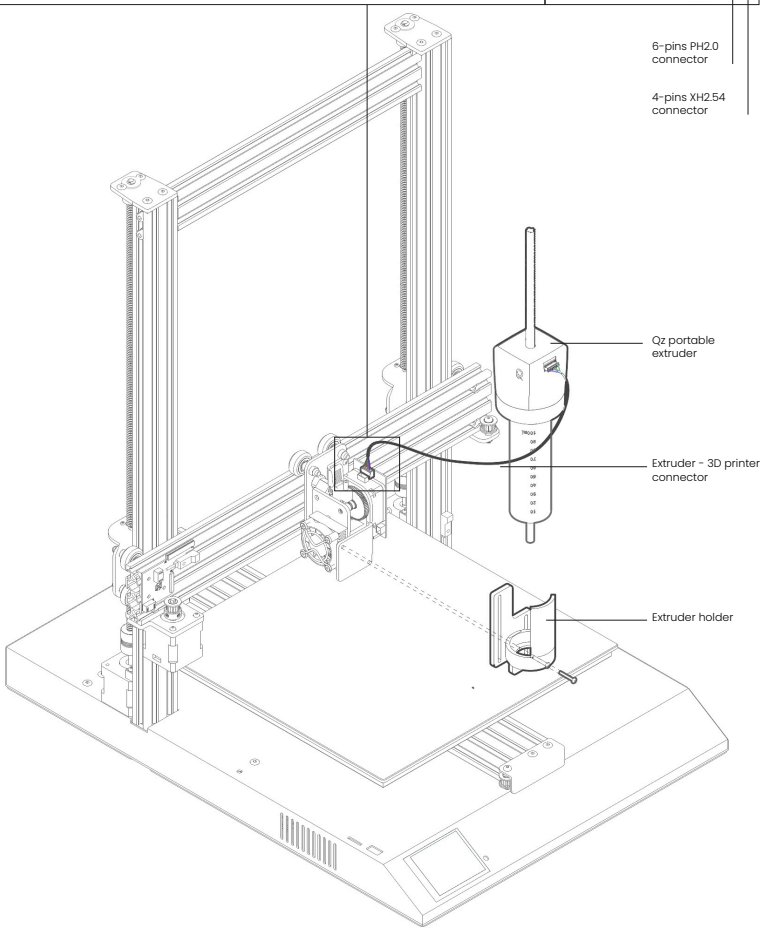
To properly assemble the extruder, follow the steps shown in the diagram:



# Extruder connection to 3D printer

To ensure proper communication between the printer and the QZ portable extruder, check that the wiring order of connector 4 pins XH 2.54 to 6 pins PH 2.0 corresponds to that of the printer in use. If not, disconnect and reconnect.





Before printing, follow this workflow:

Prepare material > Load material > Assemble extruder > Connect to control box > Disassembly > Cleaning

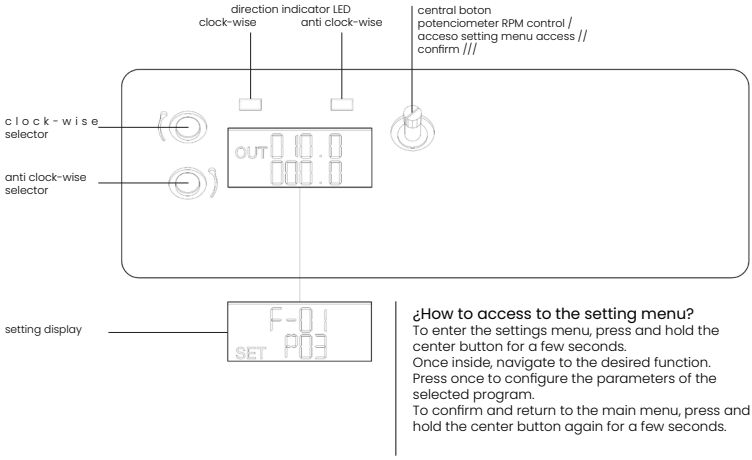
Warning:
Before the piston reaches the end of the tank, stop the extrusion to avoid damaging the device.

## Control box operations

The extruder can be controlled either through the control box or via a conventional 3D printer, as long as the motor is connected according to the wiring diagram described in the technical specifications section: mechanical features of the extruder (Motor wiring diagram).

To control the extrusion parameters via the control box, simply connect it and adjust the extrusion speed using the potentiometer, and set the motor's rotation direction using the buttons located on the left.

Below is a detailed description of the control box panel operation:



# Control box functions

The control box is set by default to program F-01 > P 03 for proper extruder operation, with the parameters as shown in the default settings table.

| Functions and parameters table | | | |
|---|---|---|---|
| Parameters | Functions | Setting range | Default value |
| F - 01 | Work mode selection | P01 ~ P09 | P01 |
| F - 02 | Number of pulses when turning the potentiometer (foward mode) | 1 ~ 999999999 | 1600 |
| F - 03 | Rotation speed in forward mode (RPM) | 0.1 ~ 999.9 | 10 |
| F - 04 | Number of pulses when turning the potentiometer (reverse mode) | 1 ~ 9999999 | 1600 |
| F - 05 | Rotation speed in reverse mode (RPM) | 0.1 ~ 999.9 | 10 |
| F - 06 | Cyclic work mode: Select number of cycles<br>('----' for infinite loop) | 0 ~ 9999 o bucle infinito | 1 |
| F - 07 | Delay in seconds ± 0.2s (forward mode) | 0.0 ~ 999.9 | 0.0 |
| F - 08 | Delay in seconds ± 0.2s (reverse mode) | 0.0 ~ 999.9 | 0.0 |
| F - 09 | Number of pulses per revolution (each unit equals x10) | 1 ~ 9999 | 160 |
| F - 10 | Configure LCD parameters:<br>1st LCD line:<br>motor rotation speed in RPM<br>2nd LCD line:<br>0: Delay time in seconds<br>1: Number of cycles | 0 or 1 | 0 |
| F - 11 | Disabled | 0 or 1 | 0 |
| F - 12 | Configure acceleration | 001 ~ 100 | 050 |
| F - 13 | Set device address | 001 ~ 255 | 001 |

| Work mode table | |
|---|---|
| Mode | Process |
| F - 01 > P 01 | 1. Function: The motor operates based on the rotation of the potentiometer. That is, the motor can only be controlled via the potentiometer, and the other buttons are disabled.<br>2. The motor rotates and the LED lights up according to the direction in which the potentiometer is turned. |
| F - 01 > P 02 | 1. Function: The motor rotates while the buttons are held down and stops when they are released.<br>2. The motor rotates and the LED lights up when the button for the desired direction is held.<br>The motor stops when the button is released.<br>Turn the potentiometer to adjust the motor's rotation speed in RPM. |
| F - 01 > P 03 | 1. Function: The motor rotates when the button for the desired direction is pressed, and stops when it is pressed again. The LED remains on while the motor is running.<br>2. Turn the potentiometer to adjust the motor's rotation speed in RPM. |
| F - 01 > P 04 | 1. Function: The motor rotates according to the number of pulses set in F-02/F-04, then stops. This cycle is repeated F-06 times.<br>2. Pressing the clockwise direction button makes the motor rotate according to F-02, then stop for the delay time set in F-07. This cycle is then repeated. The number of repetitions is defined by F-06.<br>3. Pressing the counterclockwise direction button makes the motor rotate in reverse according to F-04, then stop for the delay time set in F-08. This cycle is then repeated. The number of repetitions is defined by F-06.<br>4. Turn the potentiometer to adjust the motor's rotation speed in RPM. |
| F - 01 > P 05 | 1. Function: The motor rotates according to the number of pulses set in F-02/F-04, then stops. After repeating F-06 times, it rotates in the opposite direction to return to the initial position.<br>2. Pressing the clockwise direction button makes the motor rotate forward according to F-02, stop for the time set in F-07, and repeat this cycle F-06 times. Then it rotates in reverse to return to the starting point.<br>3. Pressing the counterclockwise direction button makes the motor rotate in reverse according to F-04, stop for the time set in F-08, and repeat this cycle F-06 times. Then it rotates forward to return to the starting point.<br>4. Turn the potentiometer to adjust the motor speed in RPM. |
| F - 01 > P 06 | 1. Function: The motor rotates according to the pulses set in F-02/F-04, stops, and changes direction. This cycle is repeated F-06 times.<br>2. Pressing the clockwise direction makes the motor rotate (F-02), stop (F-07), rotate in reverse (F-04), stop (F-08), and repeat.<br>3. Pressing the counterclockwise direction makes the motor rotate (F-04), stop (F-08), rotate forward (F-02), stop (F-07), and repeat.<br>4. Adjust the speed using the potentiometer. |
| F - 01 > P 07 | 1. Function: The motor rotates while a button is held down and stops when released, then returns to the initial position in the opposite direction.<br>2. When holding the clockwise button, the motor rotates. When released, it stops for F-07 and then rotates in reverse to return.<br>3. When holding the counterclockwise button, the motor rotates. When released, it stops for F-08 and then rotates forward to return.<br>4. Adjust the speed using the potentiometer. |
| F - 01 > P 08 | 1. Function: The motor rotates for the time set in F-07/F-08, stops, and repeats the cycle F-06 times.<br>2. Pressing the clockwise direction makes the motor rotate (F-07), stop (F-08), and repeat.<br>3. Pressing the counterclockwise direction makes the motor rotate (F-08), stop (F-07), and repeat.<br>4. Adjust the speed using the potentiometer. |
| F - 01 > P 09 | 1. Function: The motor rotates forward (F-02), stops (F-07), rotates in reverse (F-04), stops (F-08), and repeats the cycle F-06 times.<br>2. Adjust the speed using the potentiometer. |

Note:
Please stop the motor first if it is running before changing the direction of rotation.

# Technical specifications

| General specifications | | |
|---|---|---|
| | Control box | Extruder |
| Dimension [H x W x D] | 140 x 53.5 x 55 mm | 253 x 64 x 64 mm |
| Weight aprox. | 150 g | 500 g |
| Connector | EU Plug | JST HX 2.54 mm 6 Pin male |
| | HX 2.54 mm 4 to 6 Pin female | |
| Body structure | PLA | PLA |

| Electrical specifications | |
|---|---|
| Rated voltage (motor) | 2.8 V |
| Voltage | 12 V DC |
| Rated current/phase (motor) | 1.68 A |
| Supply Voltage Max | 5 A |
| Electrical network connection | Domestic electrical network 230 V AC |

| Technical extruder specifications | |
|---|---|
| Technology | LDM |
| Max dimension admissible grain | 1 mm |
| Availables Nozzle | 4 mm, 2 mm |
| Tank volume | 100 ml |
| Body Structure | Aluminiun y PLA |

| Características mecánicas extrusor | |
|---|---|
| Box and cover | PLA |
| Motor | Stepper motor Nema 17 non captive |
| Step Angle | 1.8 grados |
| Holding Torque | 44 Ncm (62.31 oz.in) |
| Rated current / phase | 1.68 A |
| Phase resistence | 1.54 ohmios |
| Inductance | 2.8 mH ± 20%(1KHz) |
| Length auger screw | 200 mm |
| Lead screw diameter | 8 mm |
| Step | 0,04 mm |
| Revolution | 8 mm |
| Phases number | 4 |
| Cable lenght | 400 mm |
| Connection diagram | A+ Red A- Grey B+ Yellow B- Green |

# Cleaning and maintenance

Tank cleaning:

• Move the piston to the beginning of the reservoir.

• Rotate the reservoir clockwise to detach it from the extruder.

• Remove the locking ring.

• Clean the reservoir and piston with water.

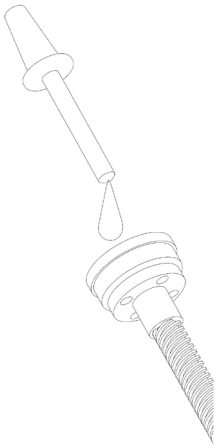
• If any residual material remains near the nozzle, use a brush or cotton swab to push it out gently without damaging the reservoir surface.

• Clean the extruder with a damp cloth, avoiding direct contact with water.

• Allow everything to dry completely before reuse.

Maintenance:

If the piston encounters resistance while sliding inside the tank, the surface may need lubrication. Apply a small amount of oil to the rubber surface of the piston and slide it back and forth a few times until it moves smoothly. Remove any excess oil before using again.



In compliance with Directives: 2012/19/EU and 2015/863/EU on the restriction of the use of dangerous substances in electric and electronic equipment as well as their waste disposal. The symbol with the crossed dustbin shown on the package indicates that the product at the end of its service life shall be collected as separate waste.

Therefore, any products that have reached the end of their useful life must be given to waste disposal centres specialising in separate collection of waste electrical and electronic equipment, or given back to the retailer at the time of purchasing new similar equipment, on a one for one basis.

The adequate separate collection for the subsequent start-up of the equipment sent to be recycled, treated and disposed of in an environmentally compatible way contributes to preventing possible negative effects on the environment and health and optimises the recycling and reuse of components making up the apparatus. Abusive disposal of the product by the user involves application of the administrative sanctions according to the laws

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