

# New Harvest in-incubator perfusion system

Electronics and controler box

---



## Contents

Bill of materials .....	3
Components assembly .....	4
Overview .....	4
Front plate.....	4
Rear plate.....	6
Bottom of the case.....	7
Wiring.....	8
USB:.....	8
4pin socket .....	8
AC Power .....	9
48 V power supply .....	9
5 V power supply .....	10



## Bill of materials

- Metal case - [Hammond Manufacturing 1458G5](#)
- Custom PMMA front and rear panel
- [Raspberry Pi 4b](#)
- [Raspberry Pi touch display](#)
- Stepper motor controller – [PoLabs PoStep60-256](#)
- 150W 48 V power supply - [LRS-150-48](#)
- 15 W 5 V power supply - [RS-15-5](#)
- 4pin socket
- 3pin socket (optional – for thermo-sensor)
- USB socket
- IEC socket
- 24V DC fan, 4cm



# Components assembly

## Overview



The controller box has components integrated on three sides:

- Front plate:
  - o Raspberry Pi display (use 4 screen holders to secure the screen in place)
  - o Raspberry Pi 4b
  - o 3-pin and 4-pin socket
- Rear plate:
  - o USB socket
  - o IEC socket
  - o 5 V power supply
  - o fan
  - o PoStep60-256 stepper motor controller
- Bottom of the case
  - o 48 V power supply

## Front plate

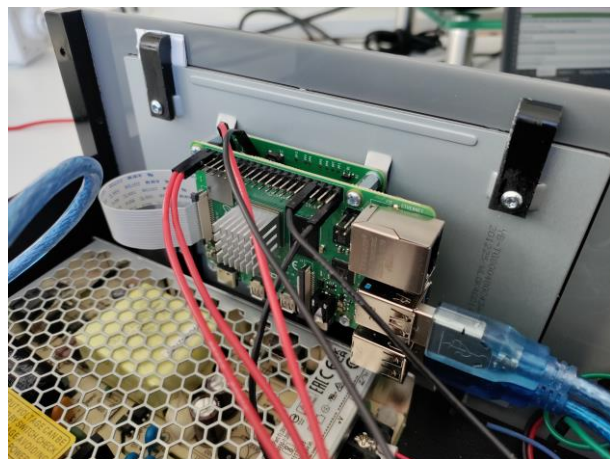
plate holders to the front (and rear)  
plate



3 mm holes to the sides of the plate holders for main case screws (43 mm from top and bottom)



Raspberry Pi and screen



Nema 34 stepper motor power supply



## Rear plate

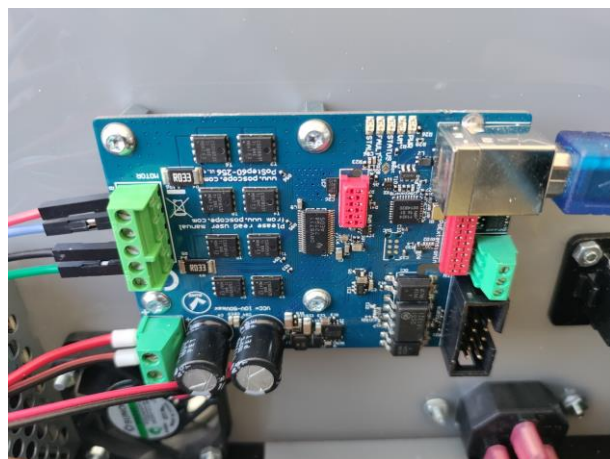
Power supply and USB input (inside)



Power supply and USB input (outside)



PoStep60-256 stepper motor controller





24V DC fan

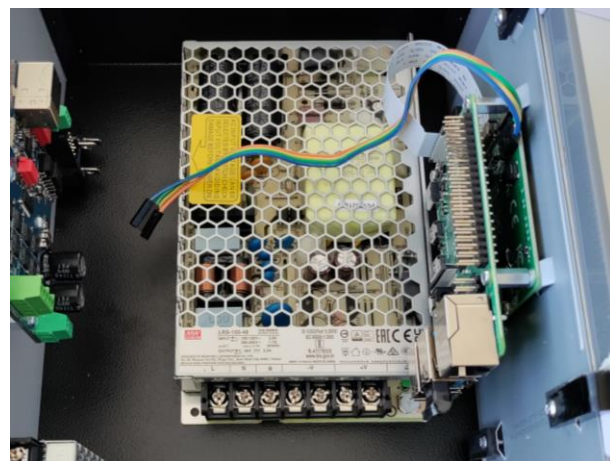


5V power supply



Bottom of the case

48V power supply



# Wiring

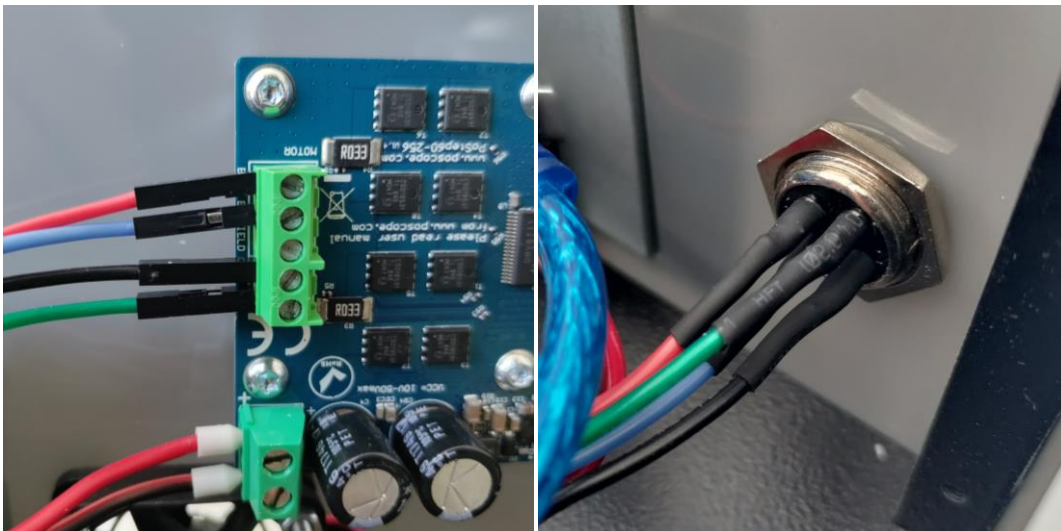
## USB:

- Connect stepper motor controller with Raspberry Pi 4b
- Connect external USB socket with Raspberry Pi 4b



## 4pin socket

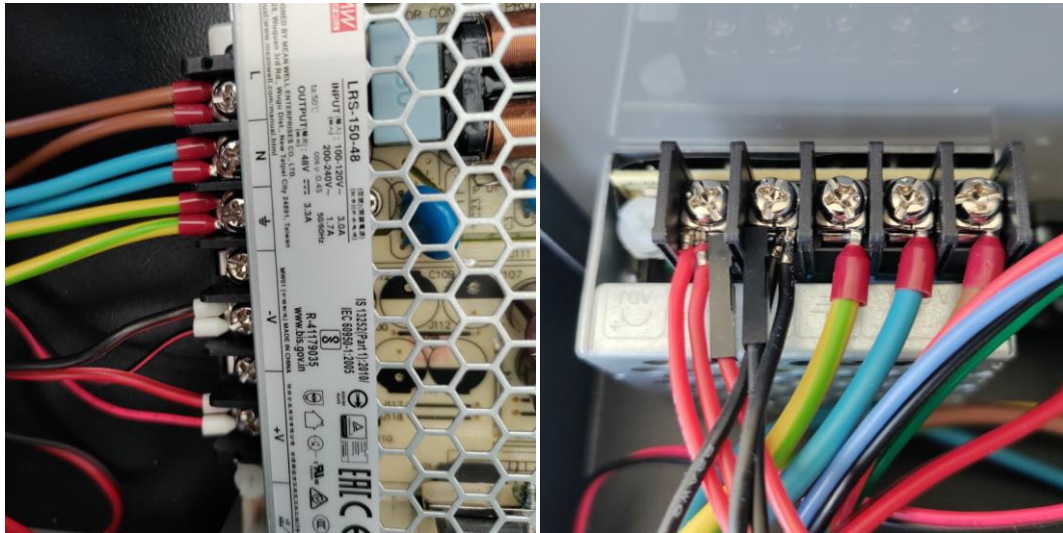
- Connect cables with green terminal labeled Motor on the stepper motor controller (red, blue, empty, black, green – green on the side closest to power terminal)





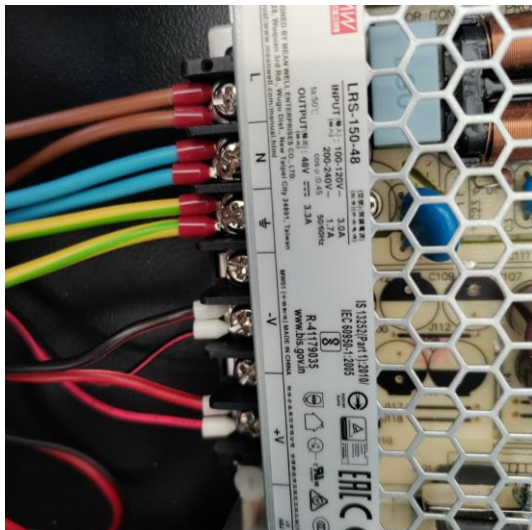
## AC Power

- Connect L, N and ground to 48 V power supply and from there to 5 V power supply



## 48 V power supply

- Connect + and - to the stepper motor controller
- Connect + and - from the fan



## 5 V power supply

- Connect + and – to the Raspberry Pi 4b
  - o Red wires (+) to pins 2 and 4
  - o Black wires (-) to pins 34 and 39
- Connect + and – to the screen
  - o Red to 5V pin
  - o Black to GND pin

